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The Australian Gardener

A Monthly Journal of Floriculture and Horticulture, for Professional, Practical, and Amateur Gardeners.

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A. J. R. WIMBLE, A.I.A., S.A.,
Manager for the Proprietors of "The Australian Gardener,"
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The Australian Gardener.

TUESDAY, JULY 1, 1902.

THE Proprietary of "The Australian Gardener" issue this publication after close investigations of current literature in absolute confidence that it will be appreciated by the public. No publication of its kind has yet appeared in Australia, devoted so exclusively to the cultivation of flowers, while large attention is already given in the Press to the more utilitarian operations in agriculture and horticulture. Under these circumstances it is clear that the Editors of "The Australian Gardener" will not be covering any field of periodical press work already in existence, nor will it be in any sense a competitor, but an accessory to the publications dealing with farm, vineyard, and orchard interests.

We therefore cordially invite the co-operation of all those who are interested in flowers and their culture, by becoming subscribers, advertisers, and contributors. Every phase of gardening operations will be dealt with, as well as scientific botany, as time and space will permit, by a careful selection of contributors and specialists. It is especially requested that any questions relating to gardening will be submitted for answers, and through this medium a great deal of valuable information may be supplied. Also any particulars of amateur efforts, successful or otherwise, and experiences of those who have long enjoyed the pleasures of gardening,

The Editors have the one principal object in view of encouraging in every possible way the beautifying of home surroundings. To make the home attractive, whether it be the humblest cottage, or even a garret, or the wealthy mansion, is to encourage a love for the beautiful in Nature. With comparatively little effort and a vast amount of pleasure this may become a distinctly national characteristic of the people of British States, as it is of the old lands, and long before was so in ancient Japan.

In the wide and monotonous expanse of our country the homesteads are far too often as bare of the beautiful in floral surroundings as the fields in autumn. Probably by reason of great claim for work in the fields, very often of a most discouraging nature, the house is neglected, no effort being make to grow trees, shrubs, or climbers, even though they require the smallest amount of attention, while flowers are apparently never thought of as a part of domestic felicity. Flowers will encourage their benefactors by growing under most adverse conditions, and it is just as easy to grow beautiful blooms as those that appear on indifferent plants.

Most homes in the suburbs of all Australian cities show some regard for the beautiful, and in many of the more favourable situations, where land is procurable, the Australian home gardens compare favourably with those in any part of the world. Our publication is issued with the object of enhancing these beauties, and supplying information in an easy and readable form to those who live in cities, and being subject to the claims of hurrying business, have not time to search widely for information.

It is impossible in a prescribed introductory article to give any adequate idea of the information to be published in "The Australian Gardener," suffice it to say that everything of practical, scientific, and artistic interest will be submitted from every possible source of literature, including translations from the works of foreign countries, as well as news from all English speaking people, and islands beyond the seas. Special features of the publication will be the distribution of knowledge regarding the native plants of Australia that may be brought into cultivation, and we shall welcome any contributions from those who perforce of circumstances have to live "far from the madding crowd," yet retain a love for the beautiful in Nature. Forestry is yet another subject peculiarly interesting to Australians, and will be largely dealt with.

Though mainly devoted to flowers "The Australian Gardener" will also contain information of a practical character upon the kitchen garden, the orchard, and the vineyard. A publication of this kind would hardly be complete without it.

No effort is being spared by the Management to make this paper acceptable to those interested, and to those who are not for that matter, in gardening in every State of Australia, and beyond her sea-girt shores.

The paper will be artistically illustrated, and descriptive in character of ornamental gardening, always with the view of practical assistance.

The circulation of the paper will cover the whole of Australia and on to New Zealand and Tasmania, and South Africa; all deliveries being through the post offices, except where other means may be found equally prompt and sure.

By reference to the commercial column on the front page it will be seen that communications may be sent to offices in all the States of Australia and beyond, and from the Head Office in Adelaide will be posted free "The Australian Gardener" for the very moderate sum of threepence per month, or three shillings and sixpence for twelve months.

We invite the co-operation of all gardeners, the teaching staffs of all public schools, and officers and members of Horticultural and Floricultural Societies throughout the Southern Hemisphere, and with this assistance success will be assured.

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Gardening Operations for July.

THE OPEN BEDS.

The month of June is perhaps one of the ugliest of the twelve in many respects from a flower gardening point of view. Invariably the gardener who takes some pride in his flowers, and who does not for that matter, will tell his visitors that he has nothing to show now. Being a midwinter month all the beauty of autumn flowers, such as Chrysanthemums and Zinnias, which are amongst the showiest bloomers, have given signs of decay, and the erstwhile beautiful Dahlia plants all help to fill up the beds with gaunt-looking objects that have done their duty in flowering. Thus it may be regarded that June is the scavenging month.

It must be presumed that all the flowers with useless top growth have been dug up and cast aside. But a word or two might be said about the plants themselves before they are done with. The majority of amateur gardeners are too apt to throw aside plants indiscriminately on to the rubbish heap, without considering that they are of any further use. This is a mistake, because they will be wanted again in a month or two. Before setting fire to the rubbish heap care should be observed to see that a stool of each variety of Chrysanthemum has been carefully set aside in some sheltered corner, kept for the purpose of preserving them. They will be wanted for replanting in August or September. The same with the perennial Phloxes.

Zinnias will have been dug out of most garden plots, although in favourable situations they may be kept going in flower even up to the end of the month. But the bulk of these plants are now on the rubbish heap, and probably a number of gardeners have not troubled to keep the seeds. This should have been done from the best flowers, and set aside for sowing in the early spring.

Coxcombs, too, in like manner, should have had the seeds taken out for planting in spring. By the way, it is a little strange that these very showy plants are so much neglected by the amateur gardener. They are just as easily cultivated as any other flower, and make a good variety for any garden.

Snapdragons (Antirrhinum), perennials, have for some months been giving a continuous supply of seeds after their vari-coloured blooms, some of which are exceedingly pretty, and the best of them having been kept, named, and planted, are coming on again as seedlings to be planted out during the month of August, although forward plants from the nurseries will be full of growth already.

Balsams, which were flowering right up to the middle of June, are amongst the most highly prized open garden plants, although, being thirsty growers, they require a plentiful supply of water. The beauty of these flowers is not shown to the best advantage, because of the close growth of the leaves with the blooms, but as pot plants they can be much better appreciated. The blooms have a modest habit, to, of hanging their heads, possibly owing to the weakeness of the flower stem. They should be much more popularly cultivated. Some of the Solferino variety and the Victoria are charming blooms. The double and the single blossoms are equally pretty and the seeds of these should be kept for planting in the spring.

The month of June then we notice, is largely regarded as the dead month, for we have seen the greater portion of the autumn beauties die away to give place to the young seedlings coming on for spring.

THE RUBBISH HEAP.

A word or two more about the June rubbish heap. In the first place, this heap is an unsightly spot on the premises, and its ugliness is due to neglect. We would not argue that a rubbish heap could by any amount of care or ingenuity be made artistic, but with a little attention it can be obscured from view, and if that alone is accomplished some good is effected in this way, and at little cost. Procure six or eight sheets of galvanised iron. Old material will do. Take four pieces of old gas or water pipe, each about six feet in length, and drive them into the ground to form four corner posts. The galvanised iron may now be laid lengthwise on edge and wired on to three sides to the posts, leaving the fourth side open to receive the rubbish. To secure the iron to the post, punch holes at the corners, and a piece of stout wire passed through the holes and around the posts will hold securely. The height of the screen, that is, whether one, two, or three sheets laid horizontally, will be determined by the position in which it is placed. This will provide a permanent, safe, and by no means unsightly structure for some retired corner of the garden.

Wheel the rubbish into this, and nobody will see it, if placed in an obscure corner, and in this it can be worked. If the rubbish recess is painted it looks all the better. Mix some soil and sand with the mould from the rubbish, throw it over a little partition a couple of feet high, and a continuous supply of stuff is available for top dressing, with the manure heap, which can be kept in another division of the rubbish screen. A little systematic work in this way saves a great deal of trouble, does away with an eyesore, and, like a tidy tool chest, the thing you want is always at hand.

YOUNG PLANTS.

Annuals, Biennials, Perennials, and Seedings.

By the first of this month most of the hardy and half-hardy annuals will have been planted out into well-dug plots, put into good heart by a full layer of old stable or cowyard manure turned in. If possible to get it the best manure is obtained from stables bedded with sawdust. This makes a compost, after having been well rotted, that will grow most plants.

It is not too late in the season to remark that the preparation of the soil is of first importance to successful gardening. We shall deal especially with this in another article, but here it may be mentioned that care should be taken to see that the soil is well drained. If not, the ground will become soured and soddened with water, especially during the winter rains. Seedlings are very tender little things, and in planting them out three essential elements should be observed. First, the preparation of the soil, upon which their life depends, and future gratification of the gardener. The ground should be well manured; well dug, with the top soil in a fine tilth; and well drained. The man who will not dig with the blade of his spade completely hidden up to the shoulder does not deserve the pleasure of getting pretty flowers, and the chances are that he will not be so rewarded. Second they should be protected from frosts, slugs, and snails, which are their common enemies, and against which they cannot protect themselves. A piece of newspaper is generally handy, and this put over the little plot will protect it from frost. Many are the devices recommended to kill slugs. We recommend the sole of a boot, or the garden trowel, as the most effectual. Third, watering. Do not wash them half out of the ground with the spout of a watercan. Use a fine spray nozzle or rose. When planting be careful to observe the size and strength of the little plants. Plant the larger and stronger growths in the centre of the plot and grade the smaller ones off to the edges of the circle, or whatever shape the plot may be designed. In this way the plants will grow better, and when in full bloom a much prettier effect will be given than if the seedings are planted in a promiscuous fashion.

ANNUALS.

Annuals are more or less roughly divided into two classes. Hardy and half-hardy. Hardy annuals are those that survive all weathers right through the winter. Half-hardy annuals cannot endure the cold, and must not be sown until the warmth of spring. Here is a list of the most popular

HARDY ANNUALS AND PERENNIALS,

a number of which are already planted out, but the operation can still go on through July:—

Anemone
Antirrhinum
Ageratum
Alyssum
Candytuft
Clarkia
Chrysanthemum
Cornflower
Calliopsis
Carnation
Dianthus
Godetia
Gaillardia
Helichrysum
Leptosyme
Lobelia
Lupin
Larkspur
Marguerite
Mignonette
Mimulus
Nemophila
Phlox
Pansy
Poppy
Ranunculus
Sweet Williams
Stock
Saponaria
Scabiosa
Statice
Sweet Pea
Verbena
Wallflower
Whitlavia

ANEMONES (tuberous and herbaceous) are always favoured by gardeners, whether at the cottage or the mansion. They like a shady moist spot in the garden, with a light, rich, well drained loam. There is a charming variety of colours, very easily grown. The Bride bears well a pure white flower, Fulgens is a striking scarlet, Pulsatilla a pure white, while Sulphurea is a delicate sulphur tint, and a hundred others are available. Some of the Japanese varieties are pretty as well as peculiar, but the price, although cheap to some, is a little above the average cottage gardener. It would be interesting to know how this plant derived its name from the Latin of windflower.

ANTIRRHINUMS (Snout-like or Snapdragon) are also perennial, but best treated as annuals, as the young plants give greater satisfaction. Some of the dwarf varieties are pretty for clustering or bordering.

AGERATUM.—Reputed to be one of the favourites of the late Queen of England, is a most useful plant for groups, or for the border. The flowers are white, lavender, yellow, and rose coloured without intermediate shades, but variegated. The habit of some is a dwarfed growth, and dense enough to make good edging.

ALYSSUM (Rage flower, supposed to allay anger) commonly spoken of as "Sweet Alyssum," is another of the little dwarfs with a radiant white bloom in the sun. So much so, in fact, that a group of white trusses in full vigour will tax the eyesight considerably on a strong sunny day. Few things in the garden are prettier than little plot designs of pure white. A yellow variety is also attractive, and can be made charming in border lines with the white. Two lines of white with a yellow centre line, or vice versa. In plots the same ideas can be worked out with a white edging to a yellow crown, and the process followed in any artistic design that may be painted roughly on paper in the two colours.

CANDYTUFT (Iberis, from Iberia, the early name of Spain), universally grown in all gardens, is one of the most useful bloomers for bouquets and wreaths. In fact white flowers are amongst the best marketable to the florist for all purposes. Iberis umbellata and I. Gibraltarica are the two most popularly known varieties. The former grows to an umbrella-shaped truss of bloom, whilst the latter takes a cone shape, some of the spikes growing to six inches in length.

CLARKIA is an American introduction, named after Captain Clark, and the dwarfs hold a deservedly popular estimation as a border flower. The colours most sought after are the elegans variety in rose, white, purple and salmon, and the pulchella in purple, crimson, and white. The Marginata (rose, edged with white) and three varieties of Rhomboides (pink) are also pretty. They are hardy growers, indifferent to peculiarities of soil or situation.

CORNFLOWER. — Centaurea, cyanus. The name is derived from the classics, Ovid having declared to heal by it a wound in one of the centaurs, who were warhorse breakers in Thessaly. This flower was exceedingly popular some years ago, and is reputed to have been the favourite of the Emperor Frederick of Germany, and ascribed as the national flower of that country Whether this is so or not it deserves to find greater popularity as a spring bloomer in Australian gardens. The varieties are very numerous, some of them having pretty silvery foliage. The colours are red, purple, yellow, white, blue, with variations of tint. Very easy to cultivate, and largely used for decorative and bouquet purposes.

Calliopsis.

CALLIOPSIS, or COREOPSIS. The latter name is derived from the appearance of the seed to that of a bug. This possibly accounts for some aesthetic gardeners preferring the first name. They are treated as annuals or perennials. Calliopsis bicolors, tinctoria, Atkinsoni, and others are true annuals, bearing red and yellow flowers. Coreopsis grondiflora is a perennial, bearing large pure yellow flowers on long stems. The colours are limited to yellows, browns, and shades of red. A Jamaica white (coreopsis alba) is rare. The plant is one of the grandest of the spring, and its graceful growth and lasting vitality through the severest heat of summer gives it a place to beautify every garden.

CARNATIONS and PINKS (Dianthus caryophyllus)—The name is derived from Deus, god; anthos, a flower (the flower of the gods). Botanically the flowers differ but little, but specialists in floriculture have standards of value from the colours of the petals, and many are the discussions that arise in Carnation societies upon the qualities and position of the markings. The distinction between a Pink and a Carnation given by Johnson is that there is in the Pink a colour at the base of every petal, and perhaps one-third of the distance along it, forming an eye, or centre, of colour, which never occurs in the Carnation or Picotee. The general division of Carnations are subdivided by shades of colours and markings, and the names are legion. They can easily be cultivated from seeds, cuttings, or layerings. We shall deal specially in another place with these charming flowers, suffice it to say here that no garden is complete without them. They love sandy soil, and are partial to salt, hence the sea coast regions in all countries produce the best flowers, especially in winter.

GODETIA (named after Godet, some say after the poet Goethe) and Œnothera (roots supposed to be an incentive to wine imbibing), of the same order, are very showy plants for massing, the gay reds and crimsons being very effective. Some good effects may also be obtained by mixing the shades of purple and white. They are early bloomers and a succession can be had by planting late in the winter.

GAILLARDIA (named after the French Botanist, Gaillard.)—This is a handsome flower in double and single varieties, usually bi-coloured, red, or may be brown and yellow. Very hardy, preferring a sunny situation and sandy soil. Requires little cultivation to keep it in bloom almost all the year through. G. grandiflora is the perennial single flowered, in a large variety of colours. G. picta Lorenziana is the double annual type.

HELICHRYSUM (from helios, sun, and chrysos, gold). The beauty, variety, and everlasting nature of the blooms of these flowers deserve more attention from cottage gardeners. Few flowers are prettier when grown in groups of white, red, yellow, orange, purple, and pink. They are divided into annuals, perennials, half-hardy, and hardy evergreen shrubs. A number have been introduced from the Cape, Western Australia, Tasmania, and Southern Europe.

LOBELIA (named after the French botanist, Lobel) is perhaps the prettiest of all annuals for edging and bordering, grouping, or designing, in fact this beautiful little annual of prevailing blue cannot well be put out of place anywhere in the garden or ornamental window pots or frames. The Erinus dwarf varieties are most popular, rarely growing more than six inches high. The herbaceous kinds are scarlet, crimson, red, yellow, and shades of blue, in a hundred varieties from all over the world. Littoralis has a trailing habit, and makes a lovely basket-plant, both with flowers and brigh seeds.

LUPINS are not largely cultivated, but it should be known that the common blue flower, quite worth cultivating, is only one of a number of other colours. The Californian Menziesii is a beautiful yellow, the Egyptian Termis is white, and the Mutabilis rose and white, Elegans is violet and rose. The bulk of these come from North America. The light-green foliage, too, makes a nice change from the prevailing darker green surroundings. The name has belied itself so far as Australia is concerned. It comes from lupus, a wolf, devastating the land. Here the perennials are valuable as a preventive against sanddrift, and some ot them are grand flowering plants.

MIMULUS, or Monkeyflower, from mimo, an ape, referring to the gaping mouth. Best treated as annuals in a moist spot in the garden. They make beautiful pot plants. The prevailing colour is yellow, but the Nobilis crimson is a brilliant flower, and also the scarlet Cardinalis. The herbaceous Alatus is described as a light blue, but rarely grown. The spotted duplex Tigrinus is a novel variety. They are easily grown in a damp soil, either from seeds, cuttings, or divisions.

NEMOPHILA is one of the daintiest of our little summer annuals. It makes charming little groups, and ribbons, centres, or circles. They are named from the Latin, nemos a grove, and phileo, love, love grove, from their native habits of modesty, and introduced from California. The tips of the petals are coloured, some speckled, and the main colours are white with purple specks, and pale blue. They will grow in almost any soil or situation.

Phlox.

PHLOX—Phlox, meaning a flame, ranks high as a favourite, and few flowers have better claim to admiration. The colouring of the blooms is intensely rich, varying down to the most delicate tints, and the flowers stood out gaily in profusion above the foliage. The growth is most favoured as seedlings pricked out in winter. The species grown by almost everybody is Drummondii, because of the number of varieties. In fact one need hardly enquire for varieties outside of this species for beautiful bloomers, large as the choice may be. As perennials a number of varieties give intense satisfaction to specialists who can produce beautiful blooms all through the year. Their cultivation from divisions and cuttings require perhaps more than usual attention, especially during the hottest part of summer heat, when they should be growing strong. Specialists differ upon the best system to be adopted, and we shall be glad to publish the experiences of growers upon their particular methods of cultivation.

PANSY—What garden on the face of creation would be complete without the viola tricolor brought in from its native habitat of the cornfields and developed into such marvels of beauty in the floral world. The plants will grow almost anyhow and anywhere, and produce blooms worth having. But the blooms that draw forth the exclamations of admiration when viewed from the show stands are not subject to such conditions. The position for good results should be protected from cutting winds, yet free to air circulation. The morning sun is best, the midday glare being too strong for the prize beauties, as under its influence the petals will lose their freshness of colour and become wilted. A cool atmosphere, a moist, rich but light, well manured, well drained soil, with applications of liquid manure, and, given good strains, the garden will gratify the most ardent admirer of the most cheerful of plant life in the show. They may be cultivated as perennials, but the best results always come from new plants. A good variety is catalogued as Benary's Mixture, Bugnot (the pronunciation should be on the "u"), aed Trimardeau Giants, although some gardeners adversely criticise the latter. The viola cornuta, tufted or bedding, pansies are specially mentioned, and with good reason. They are known as sweet violets because of their delicate perfume, and much prized for their value in bouquets.

POPPY—The plant produces a thick milky juice, and hence the name papaver. This wild beauty of the cornfields has been under cultivation for years beyond recall, and becomes popular by fits and starts according to the caprice of fashion. Nevertheless it always finds a place among the spring gaities. The Shirley poppies seem to be coming into vogue, and next spring many gardeners will have them amongst their specialties. The colours of this strain yield a great variety in the primes, and tints ranging from the purest white to the deepest crimson. The Oriental perennial poppies bear gigantic blooms from six to nine inches across in two or three colours.

RANUNCULUS (Crowfoot, from rana, a frog)—Possibly because of the peculiar appearance of the roots or tubers. The Ranunculaceæ is a large order, and amongst the commonest from all time in gardens, but nevertheless beautiful. The florists have raised it to a fine distinction from the plebeian name of Crowfoot to Asiaticus (Superbissimus). Whatever the name may imply in the matter of glory there is no questioning the fact that there is no spring garden of any pretensions whatever without the bright yellows and gorgeous reds of the Ranunculus. As seedlings sown early they can be recommended, but cultivated from divisions of the tuberous roots they give a maximum satisfaction for a minimum of labour and care. The varieties are numerous enough, and for the most part come from Europe and North America. In England they require careful cultivation, but in Australia the soil generally, whether artificially prepared or otherwise, and the climatic conditions, whether in the hills or mountains or on the plains, seem equally to favour the successful production of this flower.

STOCKS (Mathiola)—Named after the celebrated Italian botanist Mathioli. However this distinction of botanical nomenclature came to an Italian may be a study interesting to pursue, but their ancestry as an old English flower runs back a considerable period. We find Shakspeare writing about them as gillovors or gilloflower. The streaked gillovors are noticed by the shepherdess Perdita in "A Winter's Tale." The reference being to the art in Nature of the pollen of one flower being impregnated to another. Parkinson's book published in 1629 refers to carnations and stock gillovors as "the pride of our English flowers, and the queen of delight and of flowers." Fashion and the art of gardening have seen many changes through the past three hundred years, but the old time gillovors, now known as stocks, still hold a pride in the hearts of many gardeners. One writer speaks of them as being incomparable for fragrance, beauty, and dazzling effect. There are some strains of biennials, but the annuals are the most satisfactory. The most popular are the ten week dwarfs, which will grow almost anywhere. Small clumps of stocks render a most delightful fragrance to a garden, and give a good diversity of colour.

SAPONARIA.—Referred to by Johnson as soapwort, from sapo, soap, because the bruised leaves of officinalis form a lather like soap. This is one of the daintiest little flowers for artistic bordering that can be obtained amongst the annuals. They rarely grow more than six inches high, but are prolific in bloom. There are not many varieties and the colours are restricted to pinks and reds, although we notice that a yellow was introduced many years ago from Switzerland.

SCABIOSA is another good border plant in white, purple, blue, brown, pink, red, flesh, and yellow colours. A good list of hues from which to choose. The name is the worst feature of the flower. It is suggestive of disorder, and is named after scabies, known as itch, for the reason that it is supposed to cure the malady. It is also used as a cure for leprosy.

STATICE—Sea Lavender, is commonly grown as a perennial, and the flowers are prized for their keeping quality. In fact their colours keep so well after cutting that they are regarded as everlasting. The two best known as perennials are the blue Arborea and the pink or rose Dicksoni. The annuals show a good variety and some of the spikes of Warezerickii are handsome.

SUNFLOWER—The Helianthus (from helios, the sun, and anthos, a flower) is an old time favourite in every garden, all yellows, and as bright and cheerful as a flower can well be. The single and double varieties are equally popular. The giants and the dwarfs have each their fitting places, and it is not an uncommon, though inartistic, idea to plant the giants of eight or ten feet growth in small front gardens. They are not in keeping with the general fitness of things, but many people seem to have gorgeous notions about plants, and their effects. The dwarf variety, called the miniature, is most suitable for general work in planting a flower garden, and they will show a brightness in the garden when most other flowers have succumbed to the heat of summer. The perennial Sunflower should be planted out this month from roots. If the old plants are allowed to grow right through the year the blooms will be poor. They should, therefore, be treated like Chrysanthemums, and the little amount of trouble will give abundant satisfaction and pleasure.

Carnation Growing

IN AMERICA.[*]

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SO extensively is the Carnation grown in the United States, and to such a state of perfection has its cultivation developed, that a few remarks on the system there practised may be of interest—perhaps of service—to growers of that beautiful flower.

The American Carnation varieties, are, of course descended from plants imported from Europe, though they have developed into a perfect American type. The cultivation there does not date far back, for only during the last twenty years has it been really pushed. Judging from the accounts older growers give of the quality of blooms produced fifteen years ago, one marvels at the rapidity with which improvements have been effected. The main feature in the culture is the planting out on elevated stages. These stages are so constructed as to hold 4 inches to 4½ inches of soil, and are of a width and elevation which allow the work to be performed comfortably. The houses are of a light and cheap construction, with plenty of top and, where circumstances allow, side ventilation. The system of heating is by means of hot water or steam, the pipes being as far as possible laid under the stages.

There is only one method practised for the propagation of the stock, and that is by cuttings; layering is never resorted to in America. Propagation commences in January, and the cuttings are taken from the flowering plants. At the base of each flower stem there are generally to be found plenty of side shoots. At intervals the houses are gone over and some of these shoots are removed, only a few being taken from each plant lest it suffer. The cuttings are broken out sideways so as not to break the flattened base of the shoot. The length of the cutting when taken varies from 2 inches to 4 inches; nothing is cut off unless the leaves be very long, when they are shortened. The small leaves at the base are not interfered with. It will thus be seen that the preparation of cuttings is a very simple process. The cuttings are struck in sharp, clean sand, on a stage similar to those on which the plants are growing, but placed closer to the glass. No bottom-heat is afforded, and the same temperature is maintained as for the flowering plants, perhaps rather higher (55° to 60° by day, and 50° to 55° at night). They are kept on the dry side, and shaded from the sun with newspapers, and in this way root in about four weeks.

When ready the cuttings are planted out in the houses somewhat closely together for which purpose one of the flowering stages is cleared off. In a large nursery there will by this time always be found one or several stages which for some reason do not pay well. Such a stage is chosen; all the old soil is cleared out and fresh brought in; a depth of 2 inches being ample. Any light rich soil may be used; if necessary, it is fertilised with artificial manure. A temperature of 50° by day and 45° at night is generally recommended. The beds are kept rather dry. It is, of course, impossible to water without wetting the leaves, and as this is an evil, water must be given seldom and thoroughly. Too much water is likely to produce certain diseases.

The next stage in its cultivation is the planting out in the field. Of late years a tendency has shown itself to do away with the field culture altogether; in fact, in many of the best nurseries the plants never leave the houses.

The field in which the Carnations are grown in summer has been richly manured the year before. A rich loam with plenty of natural drainage is best, this being a warm soil, and, therefore, accessible early in the spring, and not likely to become too wet if the summer be rainy. It cannot be too strongly pointed out that too much water is the greatest evil in Carnation culture. The soil may be as dry as powder several inches down, but this does not kill the plants; it only stops the growth; whilst superfluous water produces diseases which cannot be cured.

The planting out near New York commences about the 10th of April, as slight frost does not harm the Carnations in the least. The work is extremely simple; the ground is ploughed, harrowed, and roughly levelled with a rake. The plants, which are lifted in the houses with as little disturbance to the roots as possible, are then placed 10 inches to 12 inches apart both ways. No more land is prepared at one time than can be planted the same day, the idea being to keep the natural moisture in the ground; no watering after planting is then necessary.

After planting, the field does not take much working other than general cleaning. The topping of the plants is most important. Three toppings are generally required, of which the first is often done in the houses. The aim is to form a short, sturdy plant with many branches near the base. All flower shoots are, of course, removed. Watering is seldom resorted to in the field, as special arrangements would have to be made, or it would prove too expensive. Much speculation has been devoted to this question, and different systems of irrigation have been proposed but as far as I know none have proved satisfactory in practice. The summer is often very hot and dry, the night temperature near New York being sometimes for a week together not below 75°. The Carnations under such conditions make no growth, not so much from lack of water as from excess of heat, and if one waters the plants during such a hot period, little benefit accrues. In August and September the nights are cooler, and the plants benefit from a rich dew and progress rapidly even when the days are equally hot and dry.

When indoor culture is adopted, the plants, instead of being placed in the field in spring, are replanted directly in the houses where they are to flower. This system has many advantages: firstly, the perfect control of the water supply which is possible; and secondly, the saving of the autumn shifting, which costs much labour and must necessarily check the plants. One disadvantage is that the old stock must be cleared out of the houses early so as to have them ready for the young plants in May or June, which means the loss of the summer crop. The plants which have been flowering all the winter are by no means exhausted, and when carefully attended to they may flower profusely all the summer, and at times fetch very good prices, as first-class flowers are not produced in the open. Another disadvantage worth mentioning is that the plants by this system will have to remain all the winter in the same soil in which they have been growing during the summer, thus requiring more feeding.

(To be Continued.)

A Cheap Shade House

can be made where ti-tree is not available, by using the bamboo vegetable baskets. These need to be soaked in water for a day or two to make them flexible, and when being nailed on to the posts and cross pieces, the nails should be driven through laths which will prevent serious splitting, and also prevent the bamboo from coming loose.

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[*] An essay read before the Kew Gardeners' Society by A. E. Casse, and published by *The Garden*.

Climbing Tea and Noisette Roses.

[FROM THE GARDENERS' MAGAZINE.]

HYBRID TEA ROSE,
Dark Crimson.

WHILE it is highly desirable the beds and borders of the gardens of those who appreciate the varied charms of the rose should be liberally furnished with dwarf and standards of the more vigorous and free-flowering varieties, it is not less important to clothe walls, fences, and trellises with varieties of scandent habit. The proposition thus briefly stated will be readily admitted by the majority of rosarians, and I therefore need not dwell upon the wondrous beauty of the more robust-growing roses when spreading their long flexile branches over wall and fence and clothing them with verdure and flowers of the most attractive colouring. My object in penning these notes is not to sing the praises of climbing roses, for that has been done on many occasions, and, it may be, by more facile pens than mine, but to refer to them from the practical side, and give a few hints on cultivation and selection that cannot fail to be useful.

In any reference to climbing roses it is necessary to very strongly press the claims of the more robust of the teas and noisettes, not alone for their beauty, but for their continuity of flowering, a perpetual habit, being in my opinion, one of the most important of the characteristics of roses grown for the embellishment of the garden and the supply of cut flowers. When the amateur rosarian fully recognises this fact he will derive a greater amount of satisfaction from his roses, and a great impetus will be given to rose culture. Hitherto, in the selection of roses for covering wall spaces, clothing fences, and trailing over bowers and arches, too much preference has been shown the Ayrshire and the Evergreen roses, and this has perhaps been in some measure due to the remarkable manner in which some of the best of them lend themselves to illustration. To obtain a good photograph of Dundee Rambler or Felicité Perpetué is well within the capacity of the average amateur photographer, and when this has been obtained, what follows is, I should assume, comparatively easy. I can fully appreciate the charming pictures produced during the season of flowering by these varieties or their kindred, no one more so.

The multifloras must be selected sparingly and relegated to a position not too prominent. There is, for instance, Crimson Rambler, which has, perhaps, been planted more largely than any other variety, climbing or otherwise, during the second half of the present century. It has been planted by its tens of thousands, and with the risk of giving rise to some opposition, I venture to suggest that the number of plants in gardens far exceeds its merits. I am quite willing to admit that Crimson Rambler has a vigorous habit, blooms profusely, and has brilliantly coloured flowers. I will admit also that it produces an effect when in bloom that is of surpassing beauty. But unfortunately its season is of so short a duration that it only extends over a few weeks. In thus stating the case I have no wish to disparage the variety, but I am desirous of placing the whole of the facts before the amateur, that he may be in a position to make a judicious selection. I have a goodly number of plants of Crimson Rambler in my garden, and I would advise the amateur to plant it freely, the numbers to be determined by the space at disposal, but not so largely as to leave but little space for the perpetual-flowering kinds. I would, indeed, suggest that the Ayrshire, evergreen, multiflora, and other groups of scandent habit that have but a short season of flowering should be planted in positions where they will not be constantly under the eye, and be trailed over roots and trunks of trees, or other supports of a rustic character.

In advocating the claims of the noisettes and the tea scented varieties for clothing walls, fences, and pillars, I would sound a note of warning and advise the planter to limit his selection to a few only of the best varieties. Both sections abound in beautiful varieties, but in making an estimate of the value of varieties we have to take into consideration points other than the size and shape of the flowers. Vigour of growth and freedom and continuity of flowering are the two chief points to consider, and I shall enumerate those only possessing these characteristics, and combine with them attractive flowers. If we glance down the list of noisettes which comprise some of the best of the climbers we shall find at least six that may be planted with the full assurance of their proving thoroughly satisfactory. Taking them in alphabetical order we have the highly popular Aimée Vibert, which has a splendid habit, and produces large clusters of pure white flowers. Not perhaps so free in flowering late in the season as some of the varieties belonging to the section, yet it must be described as one of the best of the white flowered climbers. Bouquet d'Or while producing flowers that would render good service on the showboard is strong in growth, has ample foliage and blossoms freely, the colour light yellow, suffused coppery yellow in the centre. Longworth Rambler, although introduced twenty years since, and one of the finest climbing varieties in the group, is only commencing to make its way into gardens. I hold the variety in the highest estimation, and I esteem it because of its splendid growth and freedom of flowering. The flowers are of medium size and good form, and of a very pleasing shade of rosy cerise. At no period does Longworth Rambler produce so brilliant a display as Crimson Rambler, but it blooms until the frosts put a stop to the season's growth. L'Ideal and William Allen Richardson are similar in character and colouring, and may be described as the best of the noisettes, in flowers in which red, yellow, orange, and buff are blended. I prefer the last-named on its own roots, for it grows with greater vigour, and the flowers are deeper in colour. Madam Pierre Cochet is also a very fine variety, and may be described as a refined William Allen Richardson. It is vigorous and free, but I have not grown it a sufficient length of time to be in a position to say whether it should superscede the variety to which it has been likened, or be simply grown in association with it.

The tea-scented varieties should be limited to half a dozen or so, and the best of the group is unquestionably Gloire de Dijon. It does not produce blooms that would be useful on the exhibition stage, but that is not a grave defect in a rose grown for garden decoration. In hardiness of constitution it has no equal, and if but one variety is planted, it should be the "Old Glory," as its admirers familiarly call it. Madame Berard is of the same type as the above-mentioned variety, and can be strongly recommended. Belle Lyonnaise, canary yellow, Duchesse d'Auerstadt, pure yellow-shaded nankin, Henriette de Beaveau, bright clear yellow, Madame Alfred Carriere, flesh-shaded salmon, and Madame Moreau, coppery-yellow, are all desirable, although perhaps not equal in constitution to Gloire de Dijon.

There are two points in the cultivation of climbing roses that should receive close attention. One is to provide a deep rich border, and the other to keep them free from the old and exhausted wood.

Viator.

ROSA RUGOSA.

—:o:—

[From "The Garden."]

This charming plant has given me so much pleasure and satisfaction in its growth and beauty of late years, that I have often wondered whether its many good qualities were as widely known and appreciated as they deserve. It is, of course, well known to florists, having been introduced many years ago from the northern portion of Japan, I think But there is reason to believe that it has never been planted by amateurs nor used to any extent in the adornment of either public or private grounds in this country at least. Amid all the puny and tender hybrids in the boundless realms of the Rose, what a treasure is this most beautiful and vigorous shrub. With bugs, mildew, insects and fungi of every name and nature on every side, there stands the rugosa, unassailed and unassailable, luxuriant and beautiful in leaf and flower. What a vigorous plant it is with its wealth of leafage, dark green, glossy, crumpled and leathery. What a profuse bloomer, early, late and continuous, scarcely ever without flowers in the growing season. And such attractive Roses as they are; lively rose-crimson petals, with their abundant bright orange anthers. I scarcely know of a more attractive corolla than that of the rugosa rubra Rose. Mine are large, often 2 inches in diameter. Then, too, what a beautiful setting it has, surrounded by a crowded cluster of pointed buds in various stages of maturity, some just bursting through the perianth, with bits of colour here and there, the whole nestling in a close bunch of fresh young leaves. Verily a bouquet in itself is just one blooming sprig of this charming Rose—Nature's arrangement. How much of Nature there is in this decorative shrub—its flowers and buds and its simple, robust habit. I like it the more for this reason; all untouched by the botanical skill of man, and devoid of abnormal features so prevalent in the modern floral world—just a single Rose with five large petals and delightful fragrance. Nature makes it all, and we have only to plant and admire it.

It is in all respects ironclad, and it will grow anywhere under any conditions. The red globular fruit which sometimes succeeds the flower also adds to the decorative value of the plant. It is said to grow true from the seed contained in these heps or pods, though a better and quicker way to propagate it is by suckers and off-shoots, which are freely produced. What a charming hedge it would make—impenetrable by reason of its abundant thorns, and beautiful in leaf, flower and fruit at all times.

This Rose seems to have been introduced into European countries from Japan nearly a hundred years ago. Professor Lindley has an etching of the plant in his "Rosarium Monographia," published eighty years ago, although the picture is crudely drawn and far from accurate. Just how long it has been grown in America I do not know, but it is rarely met with even now in the average garden. Who will give its history, with the facts regarding the time and manner of its introduction so far as known?

The species have been found valuable as a subject for crossing with other sorts having less constitutional vigour. There are now, perhaps, some twenty or thirty such hybrids which have been dignified with names and a host of others on-coming. But while conceding the value of these productions to the commercial florist, as a true lover of Nature I must prefer the original plant undiluted in my garden. If I am correctly informed, the first-named hybrid of this kind was produced in this country by my friend Elbert S. Carman, formerly for many years Editor of the *Rural New Yorker*. This he named Agnes Emily Carman, in honour of his wife. That is now over twelve years ago. He said it was a cross with Harrison's Yellow as the male parent. Even then he had some sixty or more similar crosses with various Hybrid Perpetuals and Teas. They were a strange progeny in appearance, and he found that very few of the rugosa characteristics were reproduced in any of them. The Carman hybrid was sent out soon afterwards to some extent and elicited considerable praise for awhile. But later accounts of it were less favourable, and now little is heard of it. The next hybrid of this class to achieve name and notice was, I think, Mme. Georges Bruant; this came out the year following, if I mistake not, and it attracted much attention also at first on your side of the water where it was produced. Afterwards came Mrs. Anthony Waterer, a very fragrant red flower, and this was followed by several others; but so far as I know none of these hybrids have ever been grown to any extent, although Mme. Bruant, a pure white semi-double rose, and the Carman Crimson which is also semi-double, are now listed by our leading growers here. The former is a cross between rugosa alba and the Tea Rose Sombreuil. It has the delicious fragrance of both parents and some of the desirable features of the rugosa stock. Both ought to prove valuable to growers if as hardy as they seem, because of their greater endurance by reason of being partly double.—H. Hendricks, New York.

—o—

Dont's For Rose Growers.

Don't curve your rose bushes into globes, you don't want imitations of puddings or footballs.

Don't let the tree butcher play his worst on your trees and bushes.

Don't have your roses so clipped that there is no free play of air and light through the bush.

Don't leave all the old and dead wood on them, and don't expect if you do to get the best results in bloom.

Don't omit to put a handful of bonedust in the hole when planting your roses.

Don't forget that if you treat your plants well they'll treat you well.

Don't forget about the climbing roses you were going to put on the arch over the gate.

Don't omit to put climbing roses wherever you can get a good effect and there is room.

Don't be satisfied with one or two, get a selection that will give you the greatest possible variety at least expense.

Don't think that because the plants you get have not large heads that they are not good healthy roses; they'll soon *make* heads if manured and watered well.

STRIKING ROSE CUTTINGS IN WATER.

The number of subjects that can be rooted from cuttings in water is much larger than is generally credited. Amongst them are roses, although they are seldom increased in this way. As a novelty it has its interesting features. A mode of striking cuttings of this kind in bottles of soft water is a plan as simple as it is practicable, inasmuch as cuttings taken off at at any time during the summer will root in this way in from five to six weeks, after which they should be potted carefully in light sandy soil, and placed in a cold frame for a week or so until established, when they are ready for planting where wanted. The cuttings should be cut clean below an eye or joint, and none of the bark bruised. It is a help to make one or two other cuts between the lower eyes, but low enough to be under water. The bottles may be of any convenient size, and may be placed in the greenhouse or room window, as the only attention they require is the filling up of the bottle with water as it evaporates. Another plan, after rooting is to fill up the bottle with a compost of light soil, and then pour off as much as possible of the water. When the soil is fairly dry the bottles can be broken, and the young plants potted on. Impatius Sultani, English Ivy, Nasturtiums, and many other things will readily root this way.

MERVEILLE DE LYON.

A LIST OF GOOD ROSES.

Antoine Rivoire—Rosy-flesh shaded and edged with carmine, base of petals yellow, large full.

Aurora—Centre of flower rich bright salmon pink, shading paler towards the outside, large full and imbricated.

Bouquet d'Or—Pale yellow, centre coppery; large full.

Climbing Meteor, a strong climbing sport from the well-known dwarf variety of the same name.

Duke of York (*Hybrid China*)—Flowers variable, between rosy-pink and white; sometimes pale with deep red centres; sometimes white-edged and tipped with deep carmine, but always beautiful and quite distinct; excellent for cutting.

Exquisite—Flowers bright crimson, shaded with magenta; large, full, and globular.

Fairy—Deep red, very small; fine for edging.

Georges Farber—Dark red.

H. M. Stanley—Clear pink, sometimes tinged with salmon, large finely formed flowers; beautiful buds.

Innocente Pirola—Cream colour, centre shaded with yellow; full and globular.

Jean Pernet — Beautiful bright yellow, changing to clear yellow; large and full.

Killarney—Pale pink shaded flesh and white; long pointed flowers.

La France—Beautiful bright lilac, rosy centre; very large and full; very free bloomer; a good bedding, decorative Rose.

Madam Cusin—Rosy-purple with yellow base to each petal.

CYCLAMENS.

CYCLAMENS (order Primulaceæ) are not so universally grown as they might be, presumably because they are regarded as the care of the specialist gardener in shade or glass houses. This is a good reason, too, inasmuch as the amateur gardener can hardly give the time and patience to them that they require, although the nurserymen assert that they are easily grown. On the other hand it must be borne in mind that once the Cyclamen is established very little further trouble is needed. In fact it is said that the tubers will last for twenty years. Being comparatively rare in ordinary gardens their presence when in full bloom is always hailed with delight by lovers of flowers. The peculiar structures of the blooms is at once attractive in their rich setting of good foliage, while their perfume is delicate and sweet.

They will grow in carefully sheltered and well-drained beds, but do not give the fine results that can be obtained from them as pot plants. They can be raised from seeds, but require a certain amount of detail care known only to those who study the cultivation. The better plan for amateur gardeners is to get the seedling plants from the nurseries, where also instructions can be obtained about the particular kind of light turfy loam, peat, leafy mould, or decayed manure from the cowyard, in which to plant them. If potted in autumn the spring blooms will make a lovely show after the corms have been growing about two years. If this is too long to wait and watch, the next best, and may be the first best, plan is to buy the tubers, although they run into extra expense. The first expense is practically the only one.

The name of Sowbread given to them seems peculiar to such a graceful and modest specimen of one of Nature's beauties, but it originated from the round, bread-like shape of the tuber, greedily eaten by the boars of Sicily, the native habitat of the flower.

Several varieties of the Persicum straw, both single and double, are worth cultivating. A beautiful snow-white flower is the Giganteum album, and the Purple King and Crimson King are superb blooms. The Salmon Queen is a lovely salmon tint. In specialties the Bush Hill Pioneer is a new feathered variety. The white flowers of this strain carry a distinct feathered crest of the same colour upon the face of each petal. This is regarded as the forerunner of an entirely new addition to culturists of the Cyclamen, the feather adding largely to the scope of interchanging the colours of the feathers and the petals.

Papilio, the subject of our illustration, is introduced as a distinct race, with broad toothed petals. The colours range from pure white, red, rose, rose with red base, and white with red base. The foliage is beautifully mottled, and the habit of the plant is as free as the older and more familiar types.

A stimulant ointment is prepared from the roots of the ivy-leafed Cyclamen, reputed to be a powerful vermifuge for children.

PRIMULAS.

These delightful primrose plants are favourites everywhere as pot-plants. Mostly cultivated in the shadehouse or greenhouse they are much prized as ornamental flowers and foliage plants for the drawing-room window. Some good varieties are the Chinensis fimbriata and Auricula. The latter are a Belgian strain, and will bloom all the winter. Forbesii (the baby primrose) is a rosy lilac colour, excellent for bouquet work, and the seedlings will flower profusely in long succession three months after sowing. Caerulea is a new blue flowering polyanthus variety.

(To be Continued.)

CYCLAMEN PAPILIO.

The Pea Tribe.

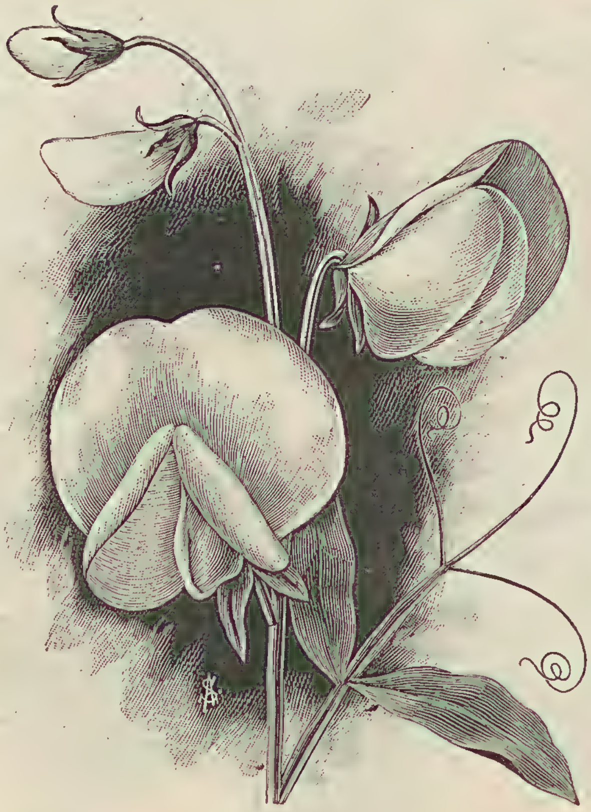
SWEET PEAS.

OUR illustrations this month are of the Sweet Pea and the Swainsona, the former so much prized by florists for its varied and delicate hues, and the latter, pretty as it is, having the bad reputation for making horses "cranky." The both belong to the important order of Leguminosæ, so called because nearly all bear pods or legumes. The order comprises some 7,000 species, of which Australia possesses nearly 1,000, it is, in fact, one of our largest natural order. Of the Acacias alone Bentham describes 193 species; of the Swainsonas, 21. The flowers figured belong to the Papilionaceous section, so named from a fancied resemblance ot a butterfly. In this section the pollen is shed and stored in the end of the keel, and if a sufficiently heavy insect or bird alights on a part of the flower suitable arranged for it the stamens push out the pollen with a jerk upon the insect or bird, to be carried to another flower for fertilizing purposes. Although the arrangements seem so well adopted for insect fertilization it is found that this does not commonly occur; perhaps the contrivance was more servicable in past ages than now. From observations made upon the well-known climber Kennedya nigricans, the writer finds that here the fertilization is done by birds. When the pollen is ready the dark inconspicious flower suddenly opens and discloses two noticeable yellow streaks. If now pressure is applied in the proper place the pollen is jerked out some inches. The N.Z. Clianthus is also bird fertilized.

The pod-bearers are as useful as they are numerous. They serve for food (peas, beans, &cc.), for fodder (lucern), for medicine (senn). They furnish gum (acacia), dyes (log-wood), sweets (liquorice), resin (dragon's blood), poisons (laburnum). They are also of service to the farmer in another direction, for upon the roots of clover, &c., are foundnodules, sometimes as large as a pea, which contain innumerable minute organisers called "nitrogen-producing bacilli." It is the action of these that brings about the improvement of land after a crop of peas. Now in England it is known that nitrogen must be added to the soil, but it is found not necessary in the northern areas of this State. Why? Because these bacilli only work in the brief period of warm weather in England, but all the year round here. This a general statement, for the writer finds that in the Hills nitrogen is still needed, either in the form of nitrate of potash or sulphate of ammonia. Presumably the cold checks the work of the bacilli, although not so much as in England.

One object of this magazine is not only to communicate and to exchange information, but to incite ou[r] readers to observe for themselves. Surely out of the 126 species of the Pea-tribe found in this State there must be many whose method of fertilization is worth noting and recording. Or even for practical purposes the nodula-bearing plants might be studied, for one might be found better than peas for developing the much-needed and valuable nitrogen.—"S."

Two years ago a bi-centenary celebration of the introduction of the Sweet Pea into Great Britain was held, and created quite a craze for the growth of this beautiful flower.



Sweet Pea.—Mont Blanc.

A number of papers were read at the conference held during the Show, and we have pleasure in extracting from "The Gardener's Magazine" some of the interesting matter in the report of that excellent paper.

At this Exhibition the best collection of 24 bunches of Sweet Peas, distinct varieties, arranged in vases with light foliage, was composed of beautiful fnll flowers of Lovely, Countess of Radnor, Princess of Wales, Venus, Mars, Navy Blue, Triumph, Blanche Burpe, Black Night, Monarch, Queen Victoria, Prince Edward of York, Sadie Burpee, Aurora, Lady Nina Balfour, Blanche Ferry, Emily Eckford, Chancellor, Lady Mary Currie, Boreatton, Duchess of Sutherland, Lottie Hutchins, America and Princess of Wales.

"THE CLASSIFICATION OF SWEET PEA."

Mr. Wright, in his opening remarks at the Conference, expressed the opinion that the time had come for reducing chaos to order in the Sweet Pea, considering this would be gainsaid by very few cultivators. The remarkable development in this plant had lifted it to the position of a florists' flower, and as such it demands to be defined and classified.

FORM OF FLOWER.

Proceeding, he said that when the parts of the Sweet Pea flower was considered magnificent raw material for floricultural excellence was seen. What clay was there for the moulder's hand! He could fill it with substance and perfect its outline. Teaching himself beforehand what perfection is, he could set himself to approach it with all the tenacity of his race. And when he had his ideal flower he could paint it with ascore of lovely hues. Many of the flowers which we have to-day are pleasing to the eye, but not satisfying to the mind. At a distance the gay, fluttering blossom is as winsome and enchanting as a butterfly, but a near inspection often reveals unevenness of outline, raggedness, notching, and kindred abominations, all of which must be swept away.

With respect to hooding, Mr. Wright spoke in almost equally uncompromising terms. While freely granting that some of the varieties which hood persistently were pleasing and pretty, he could ffut regard them as imperfect. Hooding is inherently an imperfection, because most varieties hood while immature, and again when past their best. As the hooders are a fairly numerous race, and include some of the prettiest peas, we must make a section of them, but in Mr. Wright's judgment they were floriculturally on a lower grade than the erect flowers.

It is doubtful whether posterity will find itself burdened with others than these two sections. It is true that there are numerous varieties at the present time which only hood slightly, and give many erect flowers, such, for example, as the beautiful whites Blanche Burpee and Sadie Burpee, and these might be termed half-hooders or intermediates; but once we decide to set up erectness as a standard of excellence, we find ourselves getting closer to it by selection.

Then there is reflexing, but this bound to go. It is purely vicious, hopelessly reactionary. It is characteristic of the old Invincibles and Bicolors. There is also notching. This is a horrible disfigurement. Notching is a feature of the old sorts—a relic of the black, barbaric days. Let us get away from it, breathing sighs of unspeakaffle relief. Some person has suggested that in the future we shall get fringed flowers. When we survey a variety like the fluted form of Primrose we can well believe it. But it is a fearful prospect. To sum up, we want in the ideal standard a large, bold, erect segment, firm, substantial, and leathery, smooth at the edge, even in outline, and symmetrically rounded. We will be fairly satisfied if it is the size of a half-crown, so long as the shape is right, but we shall get it bigger, and with the quality, too. Such varieties as Senator, America, and Stanley are noteworthy for excellence of standard, but there are many more.

Turning to the next pair of petals—the wings. These should not be erect, like the standard, or the tip of the keel would become unduly prominent. In the variety of Golden Gate, which is not a yellow, the wings are not vertical and open, given a resemblance to a pair of half-open gates; but this we must suppress with the strong hand. We will pass through the gates and away. The wings should be closed at the top, and slightly folded or hooded, so as to hide the tip of the keel. This likewise gives full exposure to the standard. In the keel we have another pair of segments, cohering so as to form a small pouch. We need not worry after form here. If the wings do their duty only the front of the keel will show.

Colour.

Colour must play an important part in a system of Sweet Pea classification; indeed, Mr. Wright considered the future would allot to it the leading position in view of thefew variations likely to occur in form. By the exercise of very little ingenuity we might put nearly all the leading varieties into one of several well-defined groups. We have:—

(1) *Selfs.*—This is a large, important, and beautiful class, and perhaps no better example of a pure self could be found than Salopian.

(2) *Flakes.*—A fairly large class, and one likely to increase in popularity. We have crimson flakes such as America, mauve flakes like Gaiety, rose flakes like Aurora, blue flakes like Greyfriar, and maroon flakes like Senator.

(3) *Bicolors.*—In one sense flakes are bicolors, but it would be logical to adopt a system of classifying as bicolors those varieties which have one well-defined in the standard and another in the wings.

(4) *Fancies.*—There are, and must be, no inconsiderable number of varieties which refuse to be disposed of so easily as the rest. Take, for example, the lovely Lottie Hutchins, which is lightly splashed with pink on an ivory ground. It is not a true self, nor is it a true flake. Again, there is the brilliant Mikado, which is mottled almost like an herbaceous Calceolaria. These varieties might be classified as fancies, with the subdivision white fancy, rose fancy, &c., taking the ground colour as the distinguishing feature.

(5) *Picotee Edges.*—A very small class at present, but one that might increase.

SWAINSONA.

THIS most beautiful little shrub is named after Isaac Swainson, and is described by Johnson as a greenhouse Australian evergreen shrub. If the editors of this very excellent botanical work were to take a little jaunt through some of the south-eastern and western country of Australia, they would have seen this beautiful pea shrub blooming in all its glory in the wilds, and they might have noted, for general information, that the "greenhouse" part of their description did not apply to Australia. Its beauty as a garden shrub, and the rarity of finding it under cultivation in our gardens, are full warrant for giving it a prominent place in "The Australian Gardener." It is one of the most beautiful in colour and profuse in bloom of all our native plants, while the foliage with its fern-like gracefulness, is worth cultivation for that feature alone. It may be somewhat straggling in habit, but a very little attention with a piece of string will easily overcome that difficulty. It it is not ungraceful under any conditions and very hardy. Our illustration of the white variety gives an excellent idea of its usefulness for art decorating, but the purple (Occidentalis) and the rose (Osbornii) are superb for decorations when effectively set out. The plant is easily grown from seeds.

Swainsona.

To Grow Lilium Speciosum in Pots for Exhibition.

As a rule several bulbs of this lily are grown in one large pot, as the effect is more decorative, but in this you must be guided by the schedule. Pot the bulbs one in a 5-in. pot, or three in a 10-inch pot. After the drainage half fill the pots with compost, consisting of equal parts loam, peat, leaf-mould, decayed manure and sand, and place the bulbs thereon, covering with half an inch of compost. Place the pots in a cold frame, greenhouse, or shed, and cover with ashes or cocoanut fibre refuse till growth begins, when remove to light, airy greenhouse or open position out-doors after November or December. Water freely when in full growth, and fill up the pots with compost when stem roots show. After flowering continue to water until the foliage turns yellow when gradually cease, keeping dry until May or later, when they may be repotted.

Table and House Decoration.

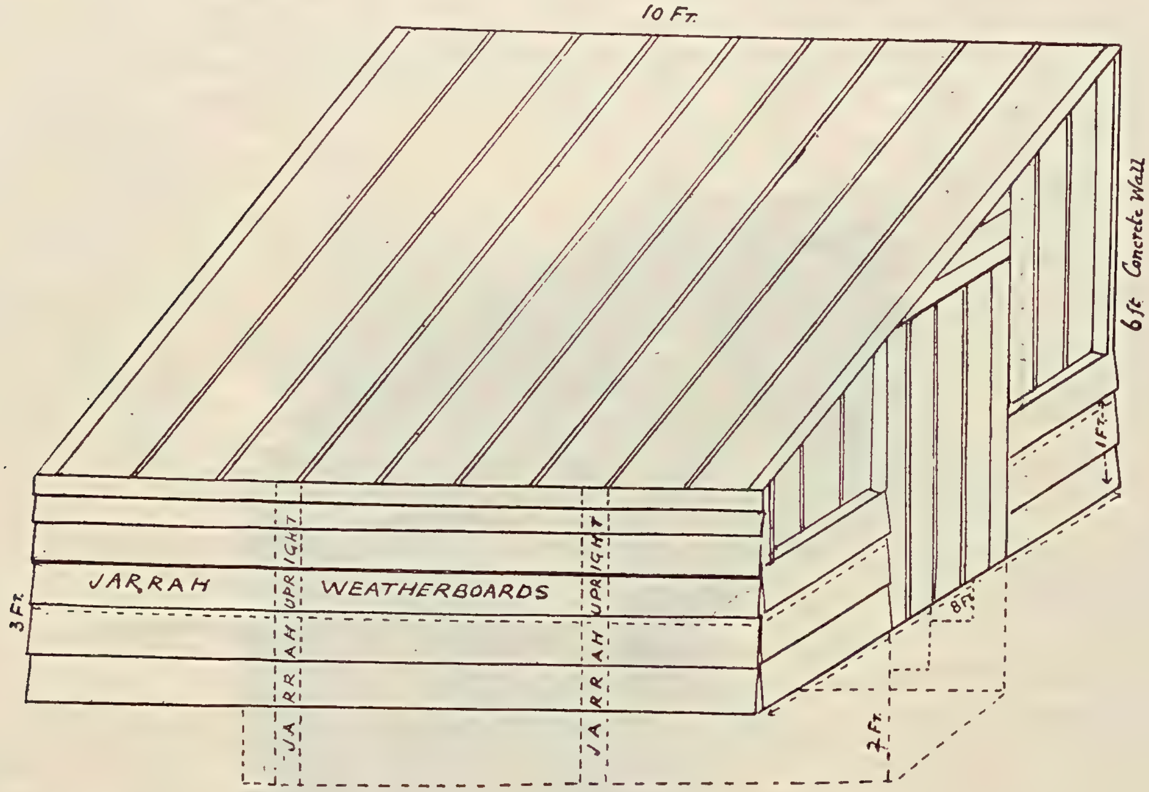
Nothing looks better for the breakfast table at this time of the year than very small Ferns, placed in little white china, silver, brass, or copper Fern pots, covering the top of each pot with fresh green Moss. On the centre of the table have a basket or dish piled up with fruit (without which no breakfast table is complete)—Apples, Oranges, Bananas, &c.; then arrange round it and about the table the little Ferns, and you will find your breakfast table will look charming.

The present is rather a bad time from the decorator's point of view; for though flowers of certain kinds are fairly plentiful, those which are most effective for decoration are rather scarce. Chrysanthemums have entirely gone out, and the useful Daffodil is still some way off from coming in. However, it is a consolation to think that a very few flowers will generally go a long way towards the effect required, if judiciously disposed and handled.

A good plan when buying flowers is to nip a little off the end of each stalk before placing them in water; and in winter it is better to use tepid water for them, which should be renewed every day.

Rough Plan of a Lean-to House.

10 x 8, TO COST £3 5s. FOR MATERIALS, LABOUR EXTRA, AND CONCRETE WALL AND BRICK EXTRA.



Excavate 2 ft. for footway, using earth to raise bench 3 ft. Brick up sides and steps.

* * *

THE above illustration will commend itself to many of our readers who are desirous of putting up a nice convenient size glass house cheaply. The question of cost looms large in the mind's eye of the lover of pot plants whenever (and it is often) the desirableness of erecting a glass house presents itself to him.

Such a house as the above when put up by a tradesman would cost from £10 to £15, a sum sufficient to deter even the most ardent plant enthusiast, unless he is well provided with this world's goods.

In the illustration the three jarrah weatherboards above the words could be secured together at the back and hinged to the wall-plate above, and this would provide sufficient ventilation.

The benefit of having a concrete wall is that a splendid collection of ferns can be grown against it by using 2-inch mesh wire netting to hold up a surface of sphagnum moss, with peaty soil filled in at the back. A suitable bed is readily provided. By pushing one finger through the moss into the peat small ferns can be bedded easily. We have seen a collection of fifteen or twenty varieties thus grown and drooping gracefully over the whole mass, and hiding it. To water this either a small spray pump or syringe or the hose direct from the tap can be used.

The bench below it would be best made of solid earth. The top soil of the pathway could be thrown over the wall, and the surface to a depth of three or four inches be made of a rich compost, in which Ferns, Begonias, Primulas, Palms, &c., would do well, and pots of other flowering plants could be placed standing directly on the soil or on inverted pots.

The lower side of the house being nearer the glass would do well for Cyclamens, Primulas, Sheptocarpus, Coleus, small Begonias of all sections, &c.

We shall have further articles dealing with pot plants, also plants for the greenhouse, and how to grow them.

The rough design above will of course need some little facility with tools to construct it, but anyone handy with tools could readily erect such a house. From time to time we shall publish valuable hints and suggestions that will enable the glass-house amateur to beautify and render his house exceptionally attractive to his friends.

Shade Trees.

[From *American Gardening.*]

By F. L. Oswald, M.D., in Heath-culture.

A FRENCH translator of the Koran calls attention to the curiouscircumstance that of all "revealed" religions Mohammedanism alone inculcates the duty of total abstinence from intoxicating beverages—the so-called temperance law of the Buddhist being merely a caution against dietetic excesses.

Yet it is perhaps a still stranger fact that not one of the numerous inspired creeds mentions a word of warning against the folly of forest destruction. The tree-felling axe has turned some 5,000,000 square miles of once fertile regions into deserts. It has cancelled our tenure of an earthly paradise; it has made one-third of the eastern continent an unfit abode of the human species.

The disappearance of arboreal vegetation is the main cause of the sad change which the good gardens of our planet have undergone in the course of the last twenty centuries. Spain, in the glory of her ancient woodlands, was the Eden of Southern Europe; treeless Spain has become a gehenna of poverty and disease. Forest shaded Sicily begat athletes and philosophers, heroes and merchant princes; Sicily in its present sun-blistered condition evolves chiefly bandits, beggars and vermin. The entire coast region of the Mediterranean has been "cleared," with the result of losing four-fifths of its former population and at least nine-tenths of its former productiveness.

The same in Southern France, in Portugal, Asia Minor, Mesopotamia. Armenia, Persia and Hindostan.

It might indeed be questioned if all human follies and crimes taken together have caused as much permanent mischief as the insane destruction of nature's safeguards against life blighting droughts. A land without trees is in as sad a plight as a flayed animal. The new world's wealth of woodlands is the chief guarantee of its prosperity.

Forests of shady leaf trees mitigate climatic extremes, and there is not the slightest doubt that they attract rain showers. A few hundred square miles of wooded dells in the valley of the Rio de San Pedro, Peru, enjoy an annual average of twenty inches of rain, while in the adjoining desert of Atacama droughts have been known to continue for six years. Ibrahim Pasha's tree plantations in upper Egypt increased the yearly rainfall from nine to fifteen inches. In Italy it has decreased one-half; in some districts of Northern Africa (the ancient Numidia, for instance) at least four-fifths. Forests shelter insect destroying birds and prevent the destructive effects of inundations by absorbing rain showers that would pour down from treeless slopes as from a slate roof.

But even from a purely sanitary point of view the blessing of shade trees justifies the claims of all Forestry Association. Leaves generate oxygen and absorb all sorts of noxious gases, thus forming a natural antidote to the atmospheric grievances of crowded cities. In towns like Savannah, Ga., with its fourfold rows of stately forest trees shading every principal street, sunstrokes are far less frequent than in the sun scorched (though more elevated) settlements of the prairie States, and in that respect the immunity of our Spanish American neighbours is chiefly due to their sensible custom of extending the siesta recess from 12 to 3 p.m. Mexican ploughmen compelled to resume work immediately after dinner would die like the peons whom the Spanish conquerors forced to work the highways in the bakeoven heat of the tropical afternoon.

Shade trees prevent ophthalmia. It is the curse of lower Egypt; it has become fearfully prevalent in Southern Italy, with the exception of comparatively well wooded Calabria, where the foothills of the Apennines fringe the coast east and west. In Sicily eye sores, in both senses of the word, can be found in every village, and I am still haunted by the recollection of a scene in the harbour suburb of Girgenti, where children with red. swollen eyelids were foraging in a dump pile and wrangling for bones with a number of equally blear-eyed dogs. There was not a tree in sight. Far up and down the undulating beach the heat of the sun made the air tremble, and the glare of its reflection from the refuse of old salt pans was almost as afflictive as the glitter of a snow field. Yet on the same spot Agrigentum, with its population of keen-eyed Greeks, flourished for three hundred years, a city of gardens and groves, rivalling the wealth of Carthage, the mistress of the Mediterranean.

Malaria, in many of its forms, is likewise a penalty of forest destruction. The clearing of the woods that once protected the slopes of the southern Alps has avenged itself upon the valleys of the North Italian rivers. Millions of cubic feet of alluvium are carried down by the mountain torrents every spring. The mud deluge swamps the fields and forms pestilential marches at the mouth of streams that were once as salubrious as the Golden Gate of the Sacramento. Between Commachio and Adria, in the delta of the Po, the coastline has advanced eight miles, the spoil of the highland streams having been deposited in the form of festering mudbanks. Fevers ripen every summer; the immoderate use of antiseptic spices (pepper, etc.) fails to check the effects of the malarious atmosphere; the coast dwellers, with few exceptions are cachetic and short lived. Swarms of virulent gnats cloud the air from June to September, and probably help to propagate the contagion. Similar causes have produced similar effects in the Pontine Swamps, where extensive tracts of alluvium become almost uninhabitable in midsummer.

Among the sanitary equipments of a model dwelling-house shade trees should rank with the best plumber's contrivances. Anywhere between Boston and Buenos Ayres a house in a grove is worth twice the rent of a house on a naked hillside. Under the influence of the same sunrays that sicken the sandhill dweller, leaf trees evolve a lung balm more effective than all the specifics of Ober-Medicinal Rath Koch. Air currents filtered through a maze of green foliage are freed from impurities and cooled sufficiently to turn dog-day misery into comfort.

Lack of the tree shade is the curse of Italian villas, and if it were not for his transcendant merits as an apostle of the fresh-air cure, one might be tempted to doubt if the value of Dr. Dio Lewis' sanitary reforms was not offset by his crusade against shade trees. There was a solarium in his private health resort, and in his zeal for the propaganda of the sunshine gospel he caused the destruction of trees enough to supply a first-class sawmill for a number of years. His objection was founded on the belief that sunshine is a microbe-killer, nature's chief specific for the cure of germ diseases; but in sparsely wooded Hindostan sunrays have not prevented the spread of frightful epidemics. They do not check the development of malaria germs in the fens of the Adriatic, nor of typhoid germs in the slums of our Southern seaport towns.

Nor would it be easy on that theory to explain the longevity of our backwoodsmen, or of the German foresters (Government forest wardens), who vie in surrounding their cottages with overarching leaf trees. Not a sunray reaches the foersterhaus from May to November, but in winter, when sunshine is really a blessing, the screen opens, or holds its own just enough to mitigate the blasts of the north wind.

A Handy Frame for the Amateur.

At a Cost of About £1.

To make a handy frame, in which most things that need glass house culture will do well and flourish, get four jarrah posts about 4 ft. long and 4 ins. square; dig four holes, 4 ft. x 6 ft. apart; bury two posts 2 ft. and the other two 1½ ft. deep, the two higher posts form the back of the frame, and the shorter ones the front. Nail pailings on the outside of the four posts so as to close them in, then bank up sand or soil against the outside of the pailings, to make the interior snug and air-tight. Nail four pieces of deal, 4 x 1. on top of the posts, with a narrow piece on the two sides for the sash to slide between. To make the sash get three pieces of oregon, 2 ins. x 1½ in. x 6 ft. long, planed and grooved; two pieces deal, each 4 ft. x 3 ins. x 2 ins. and 6 ft. by 3 ins. x 2 ins.; mortice these together and make tight with screws; mortice the top and bottom plate for 10 x 12 glass, fix the sash bars in, put the 24 sheets glass in, glaze them, and the sash is camplete.

Such a frame is a capital substitute for a glass house, and is the best possible place for raising seeds in. By sinking pots in the bed of the frame, plants a little over large may be carried some months longer, that would otherwise have to be shifted.

A piece of hessian placed over the sash, and a coat of whitewash on the glass will be necessary on hot days, and the sash will need lifting an inch or two for ventilation.

For raising seed use shallow pans, and stand them on inverted pots to get them nearer the glass, and see that they never get dry.

SCIENTIFIC.

THE FLOWER.

The flower is, as a rule, the most conspicuous portion of a plant, and the most important, because without it the perpetuation of the species could not be carried on, and the vegetable world would soon become a thing of the past, as would also the animal, which is so greatly dependent on it for life. When a plant flowers it may be said to be putting on its bridal garments, and the costumes of the different plants are as varied and beautiful as those adopted by brides of different nations throughout the world. "Be fruitful and multiply," was the command given by the Creator when animal life was brought into being; to the vegetable world also the command is applicable. Individuals have died in vast numbers in the past, but the type remains much the same throughout all generations. As Tennyson puts it when speaking of Nature, "So careful of the type she seems, so careless of the individual life."

Generally speaking, all the parts of a flower are modified leaves, and traces of the original leaf form can be readily detected; this Nature shows by turning petals of flowers into green leaves (called a freak), and in double flowers where the stamens become converted into petals (as in the Rose). In many cases the intermediate forms between floral and foliage leaves can be seen on one plant.

Now to describe the different parts of a flower. Here I cannot refrain from mentioning the fact that the terminology of Botany is more complete and exact than that of any other science, so descriptive and applicable are the terms used for each portion of the plant that it is possible to identify, without trouble, a specimen from a description which contains only a few lines. The terminology of Botany has changed but little since its inception, and this testifies to the ability and care displayed by those early workers, who handed down to us such suitable and comprehensive terms.

Inflorescence, or the arrangement of the flowers on the axis must be noted. The common stalk upon which the flowers are borne is called a peduncle; if the flower possesses stalks which connect them to the peduncle these are called pedicels; when the flower springs from the peduncle without stalks they are said to be sessile. The peduncle may be fleshy and coloured; spiral, as in the Vallisneria (an ingenious arrangement which insures the floating of the flower on the surface of water, irrespective of the depth of water); or it may be spiny, as in Alyssum. When the floral axis becomes shortened and flattened out, bearing numerous flowers, it forms a receptacle, as in the Daisy, Fig, &c. The axis is sometimes leaf-like, or, as in the Coxcomb, fasciated, *i.e.*, made up of bundles. Often adhesions take place between the peduncle, bracts, and leaves, which are difficult to trace Occasionally the peduncle is abortive, and the flower is transformed into a tendril; and at other times it is hollowed at the apex, so as apparently to form the lower part of the flower (Eschscholtzia). At the end of the peduncle the flowers are arranged, and it is really the growing part of the axis arrested to form flowers, although, as in the case of the Arum, it forms a club-shaped column; in the strawberry it is succulent; in the Rose somtimes prolonged beyond the flower and bears leaves. There are two kinds of Inflorescence—(1) Indefinite, (2) Definite. In Indefinite Inflorescence the lowermost flowers, *i.e.*, those at the base open first, and the apex keeps on producing flowers, in other words flowers indefinitely. If the peduncle is in the form of a receptacle (Compositæ) then the outermost flowers expand first. Examples—Spike, Raceme, Panicle, Corymb, Umbel, Capitulum, Spadix.

Definite Inflorescence—In this the uppermost flowers open first, or in the case of a head of flowers, the innermost open before the outer ones. It is definite because it is possible to say definitely where the flowering will cease. Examples—Solitary, Scorpioid cyme, Glomerule.

Bracts—These are leaves in the axils of which the flowers are produced. There may be one large bract, as in the Arum, which surrounds the inflorescence; two small ones, or a whorl (Daisy) underneath the flower, when they may be scaly and laid one over the other like the tiles of a roof. Anemone has three bracts branching like leaves. Oftentimes, when coloured, bracts are mistaken for petals, as is the case in Bougainvillea, in which the flower is small and inconspicuous. Bracts may be conveniently grouped under three heads: (1) Assisting in the colorisation of the inflorescence (Euphorbia); (2) a number of bracts may together mimic a flower, the true floral whorl being insignificant (Everlasting); (3) bracts may pass by insensible graduation into the true floral whorl, there being no break between true bracts and true petals (Cactus).

We now come to the flower proper, the most important parts of which are the pistil and stamens, as they are the portions absolutely necessary for the perpetuation of the species. The calyx and corolla are simply envelopes which serve to protect the pistil and stamens, and are means to an end, the highly-coloured and perfumed corolla being also an attraction for insects, which in most cases are absolutely necessary for fertilization.

(*To be Continued*).

REVIEWS.

KERNER'S "NATURAL HISTORY OF PLANTS," WITH BOTANICAL NOTES BY "S."

[We shall be pleased to review any books, magazines, or periodicals dealing with plants sent to us for that purpose.—ED.].

This work by Professor Kerner, translated by Professor Oliver and assistants, will undoubtedly take high rank as a standard book on Botany. It contains about 2,000 pages, admirably printed and illustrated by a profusion of first-class woodcuts, and several pictures in colors in the best style of German art. Its contents are addressed partly to the student, but mainly to the intelligent reader not possessed of technical knowledge. The first impressions given are that plants are much cleverer than animals: that they can defend themselves from attack by the most ingenious devices, and can even carry the war into the enemy's country: that they can provide for times of scarcity: that they can work in co-operation: that they can make the most profitable use of external circumstances, and that they know how, when their own race is run, to provide good positions for their families. This idea is well elaborated by the late Dr. J. E. Taylor in his "Sagacity and Morality of Plants."

What is the agency that brings about the wonderful fitness of plants to their environment? Modern science says "Natural Selection." But some thinkers are not satisfied with this explanation. They say that "Natural Selection" really means that plants vary, probably because two not quite identical parents are concerned with each individual plant, and that if the variation happens to suit the surroundings it lives; if not, it dies. Many failures, many blunders, and an occasional success! Henslow says that plants vary in a definite manner always suited to the requirements of the case—no blunder, none unfitted to survive. But whichever is right these theories deal only with secondary causes and modes of action; and some of the highest scientists join hands with the theologians and say there must be, above all, a guiding mind, causing the modifications that take place to be, on the whole, beneficial.

But let us get to our book: the phenomena of Nature will give us plenty of occupation without troubling ourselves about causes.

Passing over the first hundred pages, not because they are uninteresting, but because space restricts us to salient matters, we come to "flesh-consuming" plants; plants which entrap insects, retain them, and finally digest them.

The Sundews, the Bladder-worts, the Pitcher plants, and the Tooth Worts. Here the short, thick, fleshy leaves of the underground stem have the lower side swollen into a cavity with a very small inlet, through which minute creatures pass to their destruction. In this case there is no attractive secretion, and no movement on the part of the plant. And Kerner points out that many plants have simple contrivances for holding water upon their leaves, and glands suitable to imbibe this water, and as these little reservoirs often contain insects, it is probable that the plants get a little extra nitrogen even in this simple manner.

Following the insectivorous plants comes a section upon Parasites, from parasitical fungi to the Rafflesia, with a flower a yard across. In this country we have a parasite binding together large areas of native shrubs, either the imported Dodder or the native Cassytha, I have not examined it sufficiently to say which it is. We have also a Broom-rape (Orobanche Australiana), growing freely at Brighton. It has a succulent stout stem and purple-blue flowers. It would be interesting to ascertain upon what root it is parasitic.

The parasitic Langsdorffia of Central America has between the bundles of its stem a wax-like matter, which is collected and used for making wax candles. In Java a similar wax is obtained from another parasite, Balanophora elongata.

These Balanophoræ are of very rapid growth. "Imagine," says Kerner, "the surprise of a traveller upon seeing hundreds of these brown, scaly cones grow up suddenly, in the course of a night, following some days of rain, from the subterranean roots of the trees. A day or two later this garden of Lophophyla presents an altogether different picture. The brown scales have fallen off, and with them the envelope which had concealed the flowers. The female flowers are on the lower part, arranged in spherical deep-yellow or orange heads; the male flowers are above in less crowded heads, and of a pale yellow."

The stem of another Lophophytum is "pale reddish-violet, the bract scales gamboge, the ovaries yellowish, the styles red, and the stigmas white."

The tubers are eaten by the youths "to bring luck and agility in hunting, fishing, and dancing, and to enable them to win the affection of the maidens they admire."

Another allied parasite, Lathrophytum peckoltii, is "the sole instance of a flowering plant entirely destitute of all structures of the nature of leaves, with the exception of stamens and ovaries. No trace of a scale or even a swelling or rim that might be looked upon as a degenerate leaf."

The Rafflesia, already alluded to, is a parasite on the roots of vines, and puts out flower buds the size of a walnut. These grow into a cabbage-like form, and when the bracts turn back the flower grows rapidly, unfolds and displays five immense lobes round a central bowl or cup-shaped portion. The giant flower when open is best likened to a forget-me-not blossom." It is confined to Sumatra.

(*To be Continued*).

THE ORCHARD.

PLANTING FRUIT-TREES.

Mr. G. Quinn, Horticultural Instructor for South Australia, has written an article of special interest to gardeners. It appeared in "The Adelaide Chronicle," from which we extract the following:

Land intended for planting should be thoroughly prepared some time beforehand, and if it be virgin scrub or forest land a crop of cereals or vegetables should be taken off before planting fruit-trees. Heavy clay soils are not the most suitable for fruit-trees, but should such be used provision must be made for under drainage. In all cases the land should be broken up thoroughly, keeping the subsoil in its natural position. In large plantations this is best done by a strong subsoil plough following in the ordinary turning plough's furrow, thus disturbing the soil to a depth of 18 in. or 20 in. Soils that are saturated and boggy in winter in spite of draining should not be planted. Frosts are usually more severe and late in low-lying flats; consequently these should be avoided as far as practicable, and gentle undulations, or hillside slopes be chosen. Peach, apricot, cherry, and all the citrus fruits do not thrive in cold saturated soils, but require well-drained situations. Plums will withstand more moisture in the soil than any other fruits. Pears and quinces may be said to come next, while apples producing fruits desired for their long-keeping qualities should not be grown in very damp situations. In nearly every locality a windbreak is necessary, and if it be at all possible a good belt of trees—not a couple of rows—should be planted; or if natural timber be present, a strip, say of two or three chains wide, should be retained on the sides exposed to cold, cutting, or hot, withering winds. In many places the area is limited, and paling or galvanised iron fences may be put up, close to which, on the inside, rows of almonds or loquats, should be planted closely together, as they will pay for the space which they occupy and give shelter as well. Barrels or sugar baskets placed around the trees are not good protectors, as they tend to "draw" the growths up in a weakly condition.

The ultimate dimensions of the trees should be considered in connection with the soil and other conditions when planting, as in rich soils the trees will grow strongly and spread over a much wider area than in those of a poor quality. For the convenience of working, the trees should be planted either on the "square" or septuple systems; they also permit an even distribution of light and air between the trees. About 20 ft. apart can be taken as a suitable distance to plant apples, pears, plums, cherries, peaches, apricots, oranges, and lemons on the average soils of South Australia, but in richer soils greater spaces are necessary, unless the trees are judiciously pruned. At 20 ft. apart about 108 trees can be set out on an acre; 24 ft., 75 trees; and at 30 ft., 48 trees. In small home gardens where space is limited, trees may be set at 16 ft., or even less, but they require accurate pruning in summer and winter to keep them within bounds. In commercial fruit-growing there are indications that the profitable trees of the future will be of a smaller type, and consequently will be grown in closer order than heretofore. Citrus trees may be planted in the early autumn or early spring. These are the times when they begin to make young growth. They should be lifted as soon as the buds begin to lengthen in the axils of the leaves. If there is young growth an inch or more long, nip it off. If the root system is much broken, cut back the top in proportion immediately after transplanting. Always give these trees a good soaking of water as soon as they are planted.

Deciduous trees and vines should be set out in the autumn, as soon as the leaves will rub off easily. They then make young roots to replace the damaged ones before the soil becomes too cold. The trees should be purchased from a reliable nurseryman who has a reputation and trade to lose if he defrauds the purchaser in respect to the accuracy of names, stocks used, &c. In selecting the various trees, see that the plums are worked on myrobalan stocks, not on common plum seedlings or suckers. Pears should be on pear seedling stocks, and apples should be double worked, or worked on growths from blight-proof roots not less than 6 in. above the surface of the ground. The reason for this is that trees worked lower are apt, if covered by soil or mulch as high as the union, to send out adventitious roots, and thus discard the original blight-proof roots. The apricot is best upon apricot roots, and peach upon peach; but at the same time, in very dry soils, apricots may be put on almond, and peaches upon plum stocks for very wet, cold localities; but neither can be claimed as a commercial success. Every precaution against the introduction of pests should be taken, and if the trees on arrival at the orchard could be completely submerged in a strong solution of tobacco and soap mixture for about 15 minutes much vermin would be avoided. Citrus trees could be treated with strong resin wash to destroy scale insects. The nurseryman who fumigates his trees with hydo-cyanic acid gas before sending them out will prevent the necessity for all this trouble. In selecting trees, do not be misled by their sizes, as a medium-sized, stout, clean-barked tree is always more satisfactory than a skyscraper. A tree composed of one straight clean stem is desirable, as then the grower can cut the stem to a suitable length and form the trunk in keeping with requirements. About "knee high" is a good useful length to sever the stem to frame a sturdy weight-resisting tree. This will avoid the formation of weakly forks, as the arm junctions swell with growth. The roots of the young trees should receive attention. If the trees have been out of the soil for a few hours pretty well all the fibrous roots will perish; consequently, under such conditions they should be thinned out carefully. All broken roots should be cleanly severed above the bruise, and the cut should be made beneath, or on the underside of the root. If the trees have been out of the soil long, or look shrivelled bury them completely in damp soil for a day or two. This revives them considerably.

It is sometimes necessary to put a stake to support young newly planted trees, but this is not absolutely needful, and may be dispensed with in nicely sheltered positions. If stakes are used, care should be taken to avoid mutilating the roots when driving them down. They should be on the side of the prevailing wind. On the whole, it may be fairly inferred that only a small proportion of the short-trunked sturdy trees of more recent plantings will require staking for the purpose of support, but a stake is at first necessary to indicate the position of the young tree when working the soil. There are other considerations, such as suitable fencing, to keep out ground vermin, which must be properly attended to if the trees are to be a success. The following is a list of some of the most suitable trees for planting for commercial purposes. Do not plant a large number of varieties, but confine your attention to a few of the best of each class. Take into consideration any advantages of closeness to markets or proved capabilities of the locality for producing the finest early, medium, or late fruits, and go straight for that particular object. A large collection may, during occasional years, yield the best return, but the grower who discovers what he can grow thoroughly well in his particular locality and specialises on that, will come out top during a run of seasons. Besides being well grown, his crops must at the same time mature to meet a market which is not over-supplied, or if for oversea export to be ready to pack in time to be carried by boats leaving at the periods proved most advantageous. If the locality is new to fruit-growing the planter acts wisely to begin with a fairly large number of varieties, and he may afterwards reduce them to sorts proving most suitable for the place.

APPLES.

Early (for local markets only).—Dessert—Early Margaret, Red Astrachan, Mr. Gladstone, Irish Peach, William's Favorite, Lady Sudeley, Chenango Strawberry, Devonshire, Quarrenden, Gravenstein, Ribston Pippin. Kitchen—Mobb's Royal, Lord Nelson, Lord Suffield.

Late (for export or storing).—Jonathan, Cleopatra, London Pippin, Dunn's Seedling, Cox's Orange Pippin, Esopus Spitzenburg, Pomme de Niege, Cornish Aromatic, Newtown Pippin, Baldwin, Strawberry Pippin, Dumelow's Seedling, Adam's Pearmain, Northern Spy, Buncombe, Nickajack, Sturmer Pippin, Rome Beauty, Shockley, Rymer, Scarlet Nonpariel, Stone Pippin, Winter Pearmain, Rokewood.

This may appear a formidable list, and a contradiction to the above advice re selecting only a few, but it must be distinctly understood that probably in no locality in this colony can more than a dozen of the sorts named herein be brought to the highest state of excellence or matured in time to catch certain markets.

PEARS.

Early (for local markets only).—Citron des Carmes, Jargonelle, Doyenne D'Ete, Williams' Bon Chretien (known here as Duchess), Wilder.

Mid-season (local market).—Poire du Berriays, Beurre Capiaumont, Beurre Diel, Uurondeau, Flemish Beauty, Gansell's Bergamot, Louise Bonne de Jersey, Deyenne du Comice, Beurre Bosc.

Winter (Keeping or Export).—Glou Morceau (known here as late Duchess), L'Inconnue, Josephine de Malines, Beurre Clairgeau, Vicar of Winkfield (known also here as Napoleon), Winter Nells (shy bearer), Uvedale St. Germain, Swan Egg, Catillac.

APRICOTS.

Early.—Oullin's Early Peach (improved), Newcastle Early, Red Masculine, Shipley's Blenheim.

Medium and Late.—Moorpark, Hemskirke, Royal, Campbellfield Seedling.

CHERRIES.

Early Purple Guigne, Early Lyons, Early Twyford, Biggareau Napoleon, Waterloo, Florence, St. Margarets.

NECTARINES.

Early.—Hunt's Tawny, Elruge, Irrawarra, Early Rivers.

Medium.—Shortland's Tawny, Balgowan.

Late.—Victoria, Stanwick.

PEACHES.

Early.—Dessert—Brigg's Red May, Amsden's June, Alexander's Early, High's Early Canada, Early Rivers, Early Silver, Hale's Early.

Mid-Season.—Dessert—Early Crawford, Mountain Rose, Noblesse, Royal George, Foster.

After Mid-Season.—Dessert—Elberta, Old Mixon Free, Sea Eagle, Susquehanna. Drying or Canning—Comet, Salwey, Lady Palmerston, Muir, Nicol's Orange Cling, Lemon Cling, Yellow Italian.

For commercial purposes Salwey and Lady Palmerston are preferred by the canning factories, because they ripen late, when the rush of other fruits has passed. These varieties are also injured less in transit to the factories.

PLUMS.

Early (for local market).—Rivers Early Prolific, Early New Orleans, Angelina Burdett, Simoni (Japanese), Tragedy, Clyman.

Mid-Season (Dessert and Preserving).—Green Gage, Kirke's Burbank (Japanese, carries well), Prince Englebert, Washington, Yellow Gage, Reine Victoria, Ogon (Japanese).

Late (Drying, Dessert, or Preserving).—Coe's Golden Drop, Fellemberg, Prune d'Agen (French prune), Jefferson, Pond's Seedling, Wickson (Japanese, good carrier), Reine Claude du Bavay, Belle de Septembre, Coe's Late Red.

FIGS.

Dessert (Pale Skins).—White Genoa, Brunswick, White Adriatic.

Dessert (Dark Skins).—Black Ischia, Castle Kennedy, Black Turkey.

ALMONDS.

Soft Shell.—Brandis (tall grower), Nonpareil, Californian Paper Shell (low spreading trees), Ne Plus Ultra (medium habit).

ORANGES (SWEET).

Acme (smooth round fruits), Blood or Maltese, Homosassa Sweet, Jaffa, Oval China, Mediterranean, Sweet, Paramatta, Rio, St. Michael, Siletta, Valencia (late), Washington Navel.

MANDARINS.

Dancy's Tangierine, Emperor, Beauty of Glen Retreat, Scarlet, Parker's Special.

CITRUS (FOR PRESERVING).

Poorman, Flat Seville, Bengal Citron.

LEMONS.

Lisbon, Eureka, Villa Franca (the last two named sorts are nearly thornless).

TABLE GRAPES.

Black.—Black Hamburg, Black Prince, Grand Turk, Madresfield Court, Black Muscat, Mrs. Pince's Black Muscat, Wortley Hall, Muscat Hamburg, Trenthan Black.

Red.—Red Prince, Malaga, Frontignac, Lady's Finger.

White or Pale Amber.—Crystal, Belas Blanco, Morillon or Doradillo, Green's Early, Muscat (Gordo Blanco), Raisin des Dames, Daira, Sweetwater, Waltham Cross, Temperano, Santa Paula, Pedro Ximines, Grand Centennial.

For Export.—Doradillo, Daira, Belas Blanco, Muscatel.

The following design for the lunch or *déjeuner* table can be carried out with either Lilies of the Valley, Roman Hyacinths, or White Tulips. Have four pieces of pale green satin ribbin about 2 inches wide, two of the pieces about 27 inches long and the other two 54 inches each. Place them like a star in the centre, put a glass, china, or silver jar filled with either Lilies, Roman Hyacinths, or white tulips with plenty of their own leaves. I find that one of the old-fashioned cut-glass sugar bowls answers the purpose extremely well. Half a dozen blooms, with foilage, will amply fill the jar and be quite effective. At the ends of the ribbon place little bowls of the same ware as the central jar, filled to match. Four, at most blooms will be sufficient.

Don't expect hybrid perpetual roses to be perpetuality in bloom; the name is a misnomer. They only bloom in spring and autumn, and are sweet scented. The Tea roses are the true perpetual blooming roses, and the scent is reminiscent of tea. The hybrid teas like La France have, many of them, a sweet scent, and are everblooming.

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61 BROOKMAN'S BUILDING,
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The Australian Gardener.

FRIDAY, AUGUST 1, 1902.

Editorial.

THE Proprietary of "The Australian Gardener" wish to acknowledge their indebtedness to the Literary, Commercial, and Mechanical Staffs for the excellent character of their work in the first publication of this paper. Also their gratification at the number of letters and complimentary communications that have come to hand from every State in Australia, from gentlemen gardeners, professional, and also practical men, florists, seedsmen, and those generally in the trade, who unanimously agree that the publication will supply a long-felt want. We have also to thank contributors, and those who have sent in suggestions for the practical carrying on of the publication. Some of the suggestions are of a vigorous character, and many of them will probably be adopted by the Editorial and Commercial Staffs, but we must remind our friends that we are dealing only with those subjects of universal interest to the gardener that come within the scope of the publication. We shall be very pleased to specialise more extensively as time, space, and opportunity permit.

We have also to express our thanks to the officials of all the States who have courteously assisted our enquiries upon matters of public interest.

The August issue is full of special interest to gardeners in public and private grounds, and also in the less pretentious surroundings of the villa and cottage.

We wish to direct the attention of subscribers and purchasers of "The Australian Gardener" to the prizes offered for photographs of landscape gardens and of cut flowers. The photographs will be used for illustrations, and must be accompanied by a description of the picture with the plants specified and correctly named.

SHOWS IN AUGUST.

NEW SOUTH WALES.

Aug. 6th and 7th—Narrandera P. & A. Assoc.—J. T. Williams.
Aug. 6th and 7th—Forbes P., A., and H. Assoc.—N. A. Read.
Aug. 12th and 13th—Corowa P., A., & H. Soc.—E. L. Archer.
Aug. 13th and 14th—Parkes P., A., & H. Assoc.—G. V. Scabron.
Aug. 20th and 21st—Murrumbidgee P. and A. Assoc. (Wagga Wagga)—R. E. A. Shorten
Aug. 27th and 28th—Grenfell P. & A. Assoc.—Geo. Cousins.
Aug. 27th, 28th, and 29th—Northern Agricultural Assoc.—C. Poppenhagen.
Aug. 27th and 28th—Cootamundra A., P., & H. Assoc.—T. Williams.

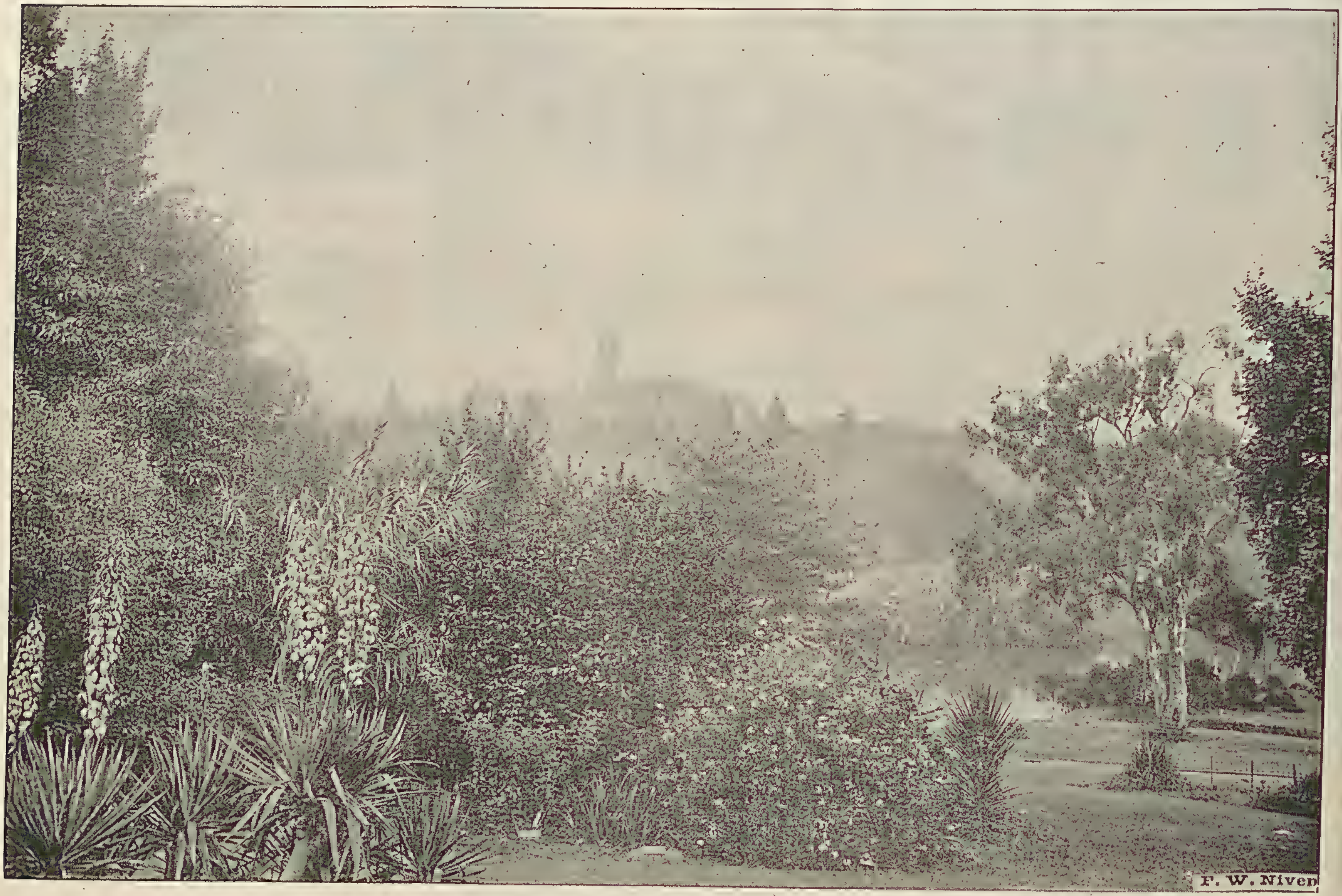
VICTORIA.

Aug. 13th and 14th—Balmoral P. & A. Soc.—A. J. Sutherland.

SOUTH AUSTRALIA.

Aug. 28th—S.A. Hortic. and Floric. Soc. Daffodil Show, Town Hall, Adelaide—W. Champion Hackett.

Government House, Melbourne.



OUR illustration is a landscape view with Melbourne Government House showing in the distance, taken from a favourite spot in the Botanic Gardens. Nothing can be seen of the Government House Grounds from any part of the Botanic Gardens. This is, however, a picturesque spot, known as the Anderson-street Lawn, which is eight acres in extent. The vegetation in the foreground of the picture gives a good view of the handsome Yucca gloriosa (Adam's needle) in flower, introduced from America (to the left), and numerous flowering shrubs, such as Pittosporum (from pitte, tar or pitch, and sporos, seed; seeds covered with resinous pulp); Rhaphiolepis, or Indian Hawthorn (from raphis, a needle, and lepis, a scale, referring to the formation of the bracts); Viburnum (from vieo, to tie; use of flexible shoots); Solanum, nightshade (from solor, to comfort, giving a soothing narcotic effect); Cestrum, belonging to the same tribe as Habrothamnus (from habros, gay, and thamnos, a shrub), also shown in the picture; Arundo, or bamboo-reed (probably from arundo, a reed). This little group of landscape garden shrubs is picturesque and very effective as shown in bloom. A glimpse of the Botanic lake is given, and one of its islands, partly fringed with Nile rush, Papyrus (from babeer, pronounced papeer, Syrian; hence papyrus) from which paper was made by the Egyptians. The Eucalyptus, gum tree (from eu, good. and kalypto, covering; referring to the flower envelope, or calyx, which covers the flower and falls off like a cap) to the right of the picture, near the lake, was in existence long before the Gardens were laid out, and therefore must be of considerable age. Certainly this and several other gum trees of the original forest, says Mr. W. R. Guilfoyle, have not increased in size during the thirty years of his directorship. To the courtesy of this gentleman we are indebted for a description of the Gardens. They are universally acknowledged as amongst the very best public gardens in all respects in the world. In our subsequent issues we shall be pleased to make use of these descriptions, accompanied by illustrations, as space will permit.

The Government House Grounds, laid out by Mr. Guilfoyle in 1873, cover an area of sixty acres, in park-like landscape with groups and lawns. Two or three acres near the residence are reserved for flower gardens, and include tennis courts and croquet lawns. The ground is undulating in character and admirably suited for the purposes of effective landscape gardening. Fenced off from the gardens proper is a large paddock for horses and cattle.

At the time this now beautiful estate was laid out it was simply a bare hill surrounded by native trees and shrubs. To bring it up to the plans arranged by Mr. Guilfoyle a tremendous quantity of soil was required to be brought in, and the task of the landscape gardener was a considerable undertaking, which now redounds to the infinite credit of the present Director of the Botanic Gardens.

GARDENING OPERATIONS FOR AUGUST.

GARDENERS who have carefully studied the advice of our practical author's eloquence in the July issue of The Australian Gardener have had a busy time under his inspiration during the month. Their gardens are looking clean and trim, ready for the bursting buds and bloom of spring. But there is no idle time for a gardener, he or she is the best occupied individual, and should be the happiest creature in existence. No occupation is so health giving, no recreation so little fatiguing, because the exercise can be taken in any quantity to suit the strength of the operator, and no thoughts more pure and ennobling than the association of flowers.

As in July so it is in August that the spade and the fork, the hoe and the rake must be kept always going, bright and shiny with the labour of keeping the paths clean and the beds in good tilth. The same influences that are going strong in the earth, and the atmospheric changes during the month of August that are at work to make the young flowers grow, also give life and vigour to the weeds. A weedy garden is like a dirty face, and too often bespeaks the character of the owner. Neither is necessary nor becoming. As ugly smudges of dirt do not enhance the beauty and cheerfulness of a face, so in like fashion a garden, however full of beautiful flowers, can never be looked upon with satisfaction where weeds abound. Weeds grow apace in August, but are never very troublesome when dealt with in their youth. The lines of a good old rhymster here come unbidden to the mind where he describes the sluggard, of whose habits it is remarked that—

> I passed by his garden and
> Saw the wild briar,
> The thorn and the thistle grow
> Broader and higher.

We must presume, then, that the readers of The Australian Gardener have all their plots neat and clean, their roses pruned, and new varieties planted. As the season is somewhat late in some situations, new roses may be planted early in August, and with careful attention will throw blooms later than those then under way with their young growth. Deciduous shrubs should have been trimmed into shape, but a few with their later buds not too far advanced will bear clipping even now. So also will the evergreen shrubs. Those that have escaped notice may have the knife put into them for shaping, but little else must be done or the flowering shoots will be interfered with.

ROSES.

At a meeting of gardeners, Mr. A. H. Scarfe, who is acknowledged as one of the best authorities on Rose culture in South Australia, made some very practical remarks upon the planting and pruning of Roses which are appropriate just now. He said:—"Planting.—I consider the best time for planting is in the early autumn, before the ground gets cold. The plants get a good start before the frosty weather, and they will make vigorous growth and produce some good blooms in the spring. Failing this, planting may be successfully carried out in July or early in August, provided that watering is attended to in dry weather, and shelter given against sharp frosts, which are sometimes very disastrous in August. Care should be exercised in separating the roots, cutting back any that are too long to a length of 8 or 10 inches, and neatly trimming off all that have been broken or bruised in taking up. Plant about 3 or 4 inches below the surface, spreading out the roots in a downward direction, radiating from the centre. Fill in some 3 inches of the soil, and tread them down as firmly as possible. Fill in more soil, leaving the plants in a basin with a little mould of earth round the stem. Fill up all round with well-rotted manure, and give them a good watering through the mulch. Stake firmly to prevent them from being blown about, and the roots loosened. Avoid deep planting, and give your plants room. In a proper Rose bed from 3 feet 6 inches to 4 four feet apart for the majority of Roses is ample. I have adopted the practice of having half-standards (with about 18-inch stems) and dwarfs alternately in the rows, which gives a good effect. Watering in dry weather should receive regular attention. Pruning.—After several years experience, I have come to the conclusion that towards the end of July or early in August is the best time for this. In my modus operandi I have adhered as closely as possible to the principles laid down by the best authorities on Rose culture. Robinson, in the *English Flower Garden*, says:—'On most Rose shoots there are a number of blooms in embyro, and were all these allowed to remain they would be necessarily small flowers. Pruning, so far as it reduces the number of flowers, concentrates the force of the plant, gives increased vigour, and thus heightens the colour and enlarges the size of the Rose. Pruning for form and vigour is absolutely necessary. Plants must be kept in form by the knife. By cutting out exhausted branches we cause young and vigorous ones to spring up from the base, and thus force the plant to renew its youth. As the object of pruning is to preserve the plant in full health and vigour, this is best secured by the removal of all dead, weakly, and unsightly growth. As soon as the branch fails it should be pruned out, and all small twiggy shoots in the centre of the plant cut away.

ANNUALS, BIENNIALS, AND PERENNIALS.

During this month a number of young hardy, and half-hardy plants may be transplanted:—

Aster
Acroclinium
Aquilegia
Amaranthus
Balsam
Cockscomb
Campanula
Cosmos
Delphinium
Daisy
Digitalis
Eschscoltzia
Linum
Marigold
Myosotis
Portulaca
Polyanthus
Petunia
Primrose
Rhodanthe
Salpiglossis
Wallflower
Zinnia

The hardy annuals planted out in July that have weathered the cold and frost and snails, are now setting into vigorous growth, and in a few weeks will be showing signs of buds. A number mentioned in our last issue may still be planted out, and gaps filled up.

ASTER (a star).—These beautiful little plants are most profuse bloomers, and for clumps in the border cannot be easily surpassed for variety of colourings. Both the dwarf and the tall varieties are useful for the garden, and in decorative boxes for indoors they are very ornamental. The prevailing colours are lilacs and blues, while others are pale red, yellow, and white.

ACROCLINIUM, or Helipterum (from Helios, the sun, and petron, a wing).—The flowers of this plant are most valuable for decorative purposes when cut just before they are full blown. They are known as everlastings, and keep their colour and freshness of appearance for a great length of time. The colours can be had in pink, and rose, and white. A cluster of pink and white everlastings are amongst the prettiest attractions in a garden. They do best in a sandy soil.

AQUILEGIA (Columbine), from aquila, an eagle.—The name is derived from the form of the petals. The Columbine is one of the oldest of English flowers that poets introduce into their musings. England is one of its native habitats, and when in the woods before it was brought under cultivation was regarded as having no particular virtue, property, or use. It was for this reason that Shakspeare prompted Ophelia to present Columbines to the King (in "Hamlet") while she was under the impression that he had killed Polonius, her father. In those days flowers had much more significance than now. Columbines have been cultivated to great perfection and beauty. The prime colours and the tints are exceedingly pretty, and add rare elegance to a mixed garden of flowers. The Scarlet Canadensis, introduced from North America, is a rich bloom, and the Glandulosa, blue, tipped with white is very effective.

AMARANTHUS (from a, not, and Maraino, to waste away).—The Amaranth is grown as a foliage plant in the open beds, the flowers being mostly insignificant, although some have plume-like handsome blooms. As late summer plants the gorgeousness of the foliage cannot be surpassed by any flower. A group here and there on the dark green of a lawn is superb. The tricolour varieties are always effective, but the carmine leaves of Henderi are rich to brilliance when the majority of flowers are drooping with heat.

BALSAM, or Impatiens.—The name is derived from a peculiarity in the elastic nature of the seedpod, which discharges the seed when ripe, or when touched. Balsams are grown in the open, but are also favoured as pot plants, because of their rich perfume. A camellia strain is much sought after, some of the blooms being very fine. Their bed does not require any special care or situation, so long as it is not too highly exposed, but they are great drinkers.

COCKSCOMB (Celosia, from kelos, burnt, the reference being to the burnt-like appearance of the flowers of some species).—Cockcombs are highly decorative plants, and with care and judgment in picking out the best of the blooms just when they are beginning to form and weeding out the indifferent growths of small combs, enormous flowers can be obtained on dwarf plants. The soil should be a sandy loam with good old manure feeding, and plenty of water. They make very showy pot plants.

CAMPANULA (bellflower).—The Canterbury Bell deserves to be raised from the somewhat common level to which many gardeners assign it. By a good many it is thought that this flower lacks character, and is straggley in growth. This may be so, but the white persicifolia is a delicate-looking bloom, and the striped red Punctata is a good variety. The cup and saucer Calycanthema is a large flowering variety well worth cultivating, while the other extreme miniature Garganica makes an effective basket plant of graceful trailing habit.

Carniatum Chameleon.

CHRYSANTHEMUMS (from chrysos, gold, and anthos, a flower.) The annual Chrysanthemum grown from seeds is a tricolor bloomer, gorgeous in a plot, and looks very fine as a background to edgings. Very suitable for summer flowering and serviceable for cuttings. The subject of our illustration is very appropriately named carniatum chameleon.

COSMOS (kosmos, beautiful).—This extremely showy and graceful plant became fashionable in Australia a few years ago. The delicate tints of the flowers in varying hues are extremely pretty, and the prolific carrying capacity of the tall growths have a striking effect anywhere in the garden on the hottest days of summer. The single blooms, set in the light feathery foliage, are set off to the best advantage. They grow well under almost any conditions and in any soil.

DELPHINIUM (from delphin, a dolphin, the spur supposed to resemble a dolphin's head). The hackneyed phrase, "common or garden sorts," now used in every-day speech to indicate something below standard, originated from descriptions of flowers in show prize catalogues. This designation is applied to the old English Larkspur, which the emigrants to Australia in early days brought with them, no doubt to make them feel at home in their new surroundings. The Larkspurs grew like weeds, and it was a rarity to find a cottage garden without this representative of the old land. Now the common Larkspur has gone out of homely fashion, and the highly-improved Delphinium takes its place. And rightly, too, for there are few flowers to compare with it. A spike of lovely deep or light blue, some eighteen inches in length, is a bloom that no eye can miss. A clump of them anywhere in the garden, a row, or a single specimen, will immediately arrest attention.

DIGITALIS (Foxglove, from digitale, a finger-stall, from the shape of the flower). This is another of the old English importations to Australia. Foxgloves have been growing in Australian gardens, one would think, ever since the first wattle-and-dab hut was erected. We see the same Foxgloves, too, year after year with unerring regularity. They are popular, however common, because of their showy spikes of bloom. They always look well. Maculata Iveryana is described as a new spotted variety, and as such it must be welcomed; while the Yellow Canariensis is a good grower for the shrubbery.

ESCHSCHOLTZIA.—This flower with such an unwieldy name, given after a doctor-botanist of the same name without the i a, generally finds a place in every garden, despite its name and unsavoury odour. The yellow, orange, and red blooms are pretty, and the foliage of sage green hue is a relief from the everlasting green of the bulk of flowers. They are rapid spreaders from their own prolific and peculiar-looking seed vessels; but the sharp, shiny spade can easily remedy this.

LINUM (Flax, from linon, flax). When making an edging to the flower bed, plant Linum Grandiflorum (scarlet) in a row behind Sweet Alyssum (white), and most visitors to the garden will be surprised at the effect. Linum has beautiful fresh-green graceful little foliage, and as a setting to the white blooms of Alyssum the effect is delightful. Then when the rich scarlet blooms appear another even prettier effect is given. Other colours are shades of yellow and blue.

MARIGOLD (Calendula officinalis, from callendae, the first day of the month). African Marigold, tagetes erecta; French Marigold, tagetes patula; Great Cape Marigold, calendula hybrida. This flower is one of the "has beens" in Australian gardening, because the common variety became practically weeds. A number of gardeners, however, were friends to the species, and occasionally one of these friends will take you round his garden, and surprise you with some of the most beautiful blooms of Marigolds that one could wish to see. The colours vary from straw to brick-red, and some of the tipped and striped petals of the double varieties are splendid blooms. The Cape Marigold or Dandelion has a bad name here. The pollen is supposed to distribute germs or set up feverish irritation, similar to what is known as hay-fever. Be this as it may, a field of Dandelions on a bright summer morning, with its glinting golden-yellow, is a sight for the æsthete to dwell upon.

MYOSOTIS (Forget me-not, from mus, a mouse, and otis, an ear; resemblance of the leaves.) This pretty little perennial, about which the sentiments of lovers linger, and the poets sing, is one of the daintiest flowers for grouping, and very choice for rockeries. It is such a universal favourite that nothing further need be remarked.

PORTULACA.—Nine times out of ten the amateur gardener, and very frequently even seedmen's catalogues spell this name with two c's, which is incorrect. This error can be easily avoided if the derivation of the name is borne in mind, viz., from porto, to carry, and lac, milk—referring to the milky juice of the plant. This is one of the very best of our summer bloomers, gay and cheerful looking while everything else in the garden may be burnt up with the sun. One writer describes it as surpassing all other outdoor plants in brilliance, delicacy, diversity, and beauty of colour. Both the single and double varieties are charming. It is an introduction from Chili and Southern Europe principally.

POLYANTHUS is a race of Primulas derived from a cross between the Primrose and the Cowslip. They require sheltered positions. Their pretty foliage and dwarf habits make them favoured for edgings, and also as pot plants for the shadehouse

PETUNIA (from petun, the Brazilian name for tobacco). No garden in Australia need be, or really should be, without Petunias, and seldom out of bloom from January to December. As bedding plants for beauty and display they take the palm. No flowers give greater satisfaction, and with very little care. They can be grown from seeds (which is the commonest method of raising) cuttings of the points of shoots, or small side shoots. Here is a little list that will give satisfaction to the most ardent admirer:—Miranda (rose), Titania (purple), Maculata (striped), Ruffled Giants (deep throats of yellow, white, black, green or maroon), Lady of the Lake (fringed pure white, double), Mr. J. Everest (rose). The fringing, blotchings, veinings, and markings are the florist's delight.

RHODANTHE (from rhodon, a rose, and anthos, a flower).—These are yet another variety of everlastings, and for grace, elegance, usefulness, and beauty they claim a space in every well-regulated garden. They are easily grown from seeds in a sandy loam, with leaf mould, and cow manure well rotted when planting out. They well repay attention, and as cut flowers they are valuable.

SALPIGLOSSIS (from salpinx, a tube, and glossa, a tongue, referring to the style in the tube of the flower).—Strange to say, this flower is so little known amongst cottage gardeners. It is one of the most fascinating plants to grow, and eminently suited to our Australian climate. The markings, veinings, rich colourings of each particular bloom make the flower a constant interest, and a plot of them can never be passed by without notes of admiration.

WALLFLOWER (Cheiranthus, from cheir—the hand, and anthos, a flower, from the custom of carrying Wallflower nosegays).—What shall we say about Wallflowers? Ask grandma, she brought them to Australia many years ago, she could not live in a cottage without them in the garden. It would not seem like home. Ask anybody and everybody about Wallflowers, and the opinion goes all one way upon their delightful perfume, and rich colourings.

ZINNIA (named after Zinn, a German botanist).—These flowers have not received the attention they deserve. They delight in the summer sun. Revelling in the heat with plenty to drink, they make our summer gardens delightful. There is plenty of variety in shades of colour and marking, and will stand lots of neglect, though with proper attention they do well, like everything else that is cared for in the garden.

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BULBS.

The culture of bulbs is a fascinating study with many gardeners, some of whom have made it a hobby, and have gained famous names for themselves. In this connection the name of Peter Barr, "the doffodil king," at once comes to the memory of Australians who a short while ago had the pleasure of meeting this genial old English gentleman and hearing him talk about his pet flower. Several Australians are also on the high road to fame in the same direction. In the realm of flowers specialists work in the same way as those in the scientific laboratory. Much, very much, of their work never sees the daylight of public recognition, but it goes on all the same, seen or unseen, and the inspiration that keeps them working is pure love, without any ulterior motive than that of success in reaching their ideals. If the botanical specialists were to suddenly cease working, professional gardeners would soon feel the pinch of poverty, and the amateur would find his garden on the down grade.

Johnson's work gives a very succinct description of bulbs. He explains that a bulb is really an underground bud. Its fibrous or real roots die annually; but the bulb remains stored with elaborated sap, and retaining the vital powers of the plant, ready for reproduction at the appropriate season. Besides root bulbs (such as the onion) there are stem, or caulinary bulbs, equally efficient for propagation. The stem bulb consists of a number of small scales closely compacted together in an ovate or conical form, enclosing the rudiments of a future plant, and originating sometimes in the axil of the leaves, and sometimes at the base of the umbel of flowers. In both cases it is nourished by the parent plant till it has reached maturity, at which period the bond of connection is solved and the bulb falls to the ground, endowed with the power of striking root in the soil by sending out fibres from the base, and so converting itself into a new individual.

Every bulbous rooted plant has its management given in its proper place; but there are a few rules of general applicability. They should be moved where necessary while in a state of rest. This occurs to the summer flowering bulbs in early autumn, and to autumn flowering in spring. Many require to be taken up annually or, at furthest, every second or third year, to remove the accumulated offsets. No bulb should be kept long out of the ground, and, even during the time it is necessarily so kept, it should be stored in a dry well ventilated room or shed.

Their culture is very simple. They do well in any rich well drained soil, preferring sandy loam. Very little attention is required, and many of them bloom year after year without being removed at all. The application of fresh manure is very often a cause of injury to them by unsuspecting and inexperienced gardeners; bonedust and chemical manures are also injurious. Only well rotted manure should be used, and this ought never to touch the bulbs. March is the best month to plant the spring flowering bulbs, and winter and early spring for the summer flowering.

Bulbs, tubers, and corms that are included in the spring flowering list that should be making a good show this month and next include:—

Anemone
Alium
Babiana
Crocus
Daffodil
Freesia
Grape Hyacinth
Hyacinth
Iris
Ixia
Jonquil
Lachenalia
Narcissus
Polyanthus-Narcissus
Ranunculus
Sparaxis
Scilla
Snowflake
Tritonia
Tulip

Carnation Growing

IN AMERICA.*

THE housing is carried out in August and September. The houses are cleaned thoroughly, whitewashed and painted, and fresh soil is placed on the stages. Good loam mixed with manure the preceding winter or autumn, and supplied with some bonemeal and chemical manure, is generally recommended. It is very important that all natural manures should be thoroughly decayed, as the Carnation does not develop healthily where fresh manure is present in the soil.

When the plants are lifted in the field all the soil is removed from the roots, this operation being best performed with a digging fork, one man lifting the plant whilst another gently shakes the soil off. A few years back the general practice was to shift the plants with a ball, but this method is now entirely abandoned. It does not pay to carry a quantity of old exhausted soil inside. If the houses be well shaded, in the course of a few days the plants look as if they had never been disturbed. In the newly-planted houses great care is taken as to watering and frequent syringing is practised.

The first full crop of flowers is borne about twelve weeks after planting, although man flowers may be cut even a month after. As the plants make their best growth in the field in August and September, late planting has its great advantages, and planting in the latter part of September gives the best crop for Christmas. No good prices can be expected for Carnations before the Chrysanthemums are over.

Attention in winter is simple. When days get shorter all syringing is discontinued, and the water, which is given with the hose, is carefully applied between the rows. The temperature is kept at 50° by day and 45° at night. It is a good plan even in mild weather to keep the fire going and to open the ventilators, as the Carnation likes a dry atmosphere, and fresh air tends to open the flowers well.

Most varieties need some support, which is always given by means of galvanised wire rings placed one over the other, and attached to stakes in the soil. The use of wire rings is much preferable to tying strings; it gives a tidier appearance, and, whilst keeping the plants together, permits of a free natural growth, and, what is an important point, makes the cutting of the flowers easy. The wires are, of course, rather more expensive in the first instance, the best costing 27 dols. per 1,000, but they last seven to eight years and are extremely easy to put up.

A very important item is the feeding, especially where the plants have been grown on the stages all the summer. To apply liquid manure with a watering-pot would not pay, as it would take too much time. It is generally distributed from a main tank with a steam pump and hose. The stages are fre-

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*An essay read before the Kew Gardeners' Society by A. E. Casse, and published by *The Garden.*

quently top-dressed, a mixture of natural manure, wood ashes and chemical manure being used.

One of the most important operations is the dis-budding, as each flower-stem can only develop one good bloom; all the other buds must be removed early. It is work which, of course, takes much time, but it pays to do it. It does not require any special knowledge or judgment, as it is always the top bud which is the best; in large nurseries girls are employed for this work.

Anyone who has worked among Carnations will have noticed the bursting of the calyx which so often occurs and makes the flowers unsaleable. Some varieties are more liable to this bursting than others. When selecting seedings one may at once throw out all those which show short thick buds, as these always burst and are absolutely valueless, no matter how fine the colour may be But it is not in all cases the structure of the bud which controls the calyx-bursting, and in the good established varieties the percentage of bursting calyces varies greatly from day to day. It is evident that exterior conditions, chiefly temperature and light, have great influence in this respect. I believe that sudden change of temperature is one of the main causes, as also is lack of light. On dark days, and when the houses have been covered with snow for a day or two, almost all the calyces burst. Excess of moisture in the air may also play a part.

In American nurseries the Carnation is often used to replace the Chrysanthemum when these have done flowering, the latter often being grown on similar stages to those used for Carnations. At this time of the year it is, of course, a question of great economic importance to have a continuous crop of flowers from the houses. For this purpose the Carnations are, in the beginning of October, planted in boxes with removable sides, and of a length and depth which allow of their being fitted into the benches. These boxes may be kept in cold frames. When the Chrysanthemums have done their duty they are cleared out and all the soil removed from the stages, and the Carnations are then easily fitted into their place, and in a short time give a fine crop.

The gathering of the flowers is always done some twenty-four hours before they are sent to the city. The transport is generally by railway, as the nurseries are mostly situated far away from their market.

The number of varieties is very large, and is every year being increased through the introduction of many more or less valuable kinds. Few of them stay in cultivation for any length of time, as they soon begin to deteriorate, or when attacked by diseases prove absolutely unable to resist. The deterioration is shown in the decreasing size of the flowers, the bursting of the calyces, and the decrease in general vitality. A good deal has been written in the professional press about the possible causes of the deterioration, but I have never seen anything like a satisfactory explanation. Most experts seem to believe that over-propagation is the main cause. The Carnation is very sensible to changes of environment, climate, and soil. Because a variety does well in one locality, it does not follow that with similar treatment it will prove satisfactory in another.

The Carnation, as are all other cultivated plants, is subject to a great many animal pests and fungoid diseases. Mice, slugs, red spider, and green fly need no mentioning. Of fungoid diseases, black spot, rust, and dry stem rot are most destructive. When taken in time black spot and rust can easily be cured by the application of Bordeaux mixture.

By far the most destructive disease in the dry stem rot, which every year causes thousands and thousands of dollars' loss to the nurserymen. Most frequently it appears in the houses shortly after the planting in autumn.

The first visible sign of the disease is a fine reddish stripe running along one side of the stem and extending to one or several branches. This marking, the cause of which must evidently be sought in the tissue next to the epidermis, becomes more and more prominent, and the leaves commence to die off till the plant becomes entirely dry and withered, the stem ultimately breaking off at the root-stock. On examination the tissue here are found to be quite destroyed, and only a mass of dry fibres remains; the roots, however, seem unaffected.

Carnations and Picotees.

The plants may be attacked by this disease both when planted in the houses and when in the field. A few individuals scattered in the beds may become affacted and die slowly, or large lots may die off with astonishing rapidity. The disease seems to get better hold when the beds have been lately treated with organic manure; virgin soil fertilised with chemical manure seems safe. Again, plants placed a little too deep in the soil are often attacked before the surrounding plants, and such individuals regularly succumb to stem rot even where it does not appear on those properly planted in the same bed. Superfluous moisture also seems to play an important part. I do not say that this simple system results in the very highest development of plant and of flower in themselves.

When cultivating plants in pots one has without doubt far better control of the wants of each individual. Even with as many as a thousand plants in a house one can, to a certain extent, give each a special treatment according to its individual requirements. On the other hand, when one has them all in the same soil they must need all be treated in the same way; the requirements of each individual cannot be considered. For raising specimen plants or fancy flowers there is no doubt that pots are indispensible, but there was never a large and permanent market for such stock, and it is difficult to make it pay.

As a paying industry I believe the American style of producing cut flowers from plants planted out in the houses and flowered at a low temperature, giving a continuous supply all through the winter, is a decidedly good one. I may add that the same system is practised in the case of Roses, Chrysanthemums, Mignonette, Violets, and, in fact, all florist's flowers except bulbs, and the flowers sold in New York are in no way inferior to those sold here. Most likely the American style will in time be practised also in Europe; in fact, in Southern Germany many large Carnation nurseries are already arried on on American principles.

CINERARIAS.

TOWARDS the end of July the glasshouses in the public Botanical Gardens are a constant source of attraction to visitors, and with good reason. There lovers of the beautiful in bloom linger with longing gaze and expressions of admiration upon the delightful hues of the richest colourings and sweetly pretty tints of the Cinerarias. The sight gives rise to many a heartfelt wish that the visitors could grow flowers so delightful to adorn their own homes. And why should they not? Many and many a window looking forlorn with uninviting and inelegant faded drapings and curtains could be made attractive and cheerful with a pot of lovely Cinerarias, and kept so many weeks. Even the foliage is rich and beautiful long before the flowers come to complete the adornment. Not only could this be so in the cottage window, but the stately drawing-room could be made brilliant in live colouring by the addition of a plant or two of this most lovely flower. True it is generally regarded as a florist's flower, but florists have by no means the monopoly, as some of the most magnificent displays of it are seen outside the florist's domain. We have seen them in the open beds, not by being transplanted from the pots when just coming into bloom, which is a common practice, and a happy idea, too, of the professional gardener, but grown in the beds from seedlings. This notwithstanding that they are fair game for Jack Frost, who looks upon the broad delicate foliage as his special prey. But they are essentially a greenhouse plant to be grown in their best garb of glory. Their glory has now departed for the season. After blooming they should be removed from the house. The old flower stems should be cut down, except those that are required for seeds, and the pots placed outside upon a bed of ashes in an open situation. Water them in moderation, and as soon as the offsets have made a leaf or two cut them off without injuring the roots. Put them into small pots in a cold frame, shading them from the light for two or three weeks, after another week with sunshine they will be rooted ready for larger pots. Repot them into their flowering pot after they have become well established, care being taken to see that they do not become potbound. In a rich compost with plenty of water they will be found to be good growers with very little trouble. Insects are rather partial to them, as they are to most other good things, but a little tobacco fumigation will help them against their natural enemies.

Cineraria Hybrida Grandiflora.

Children in Out-door Work.

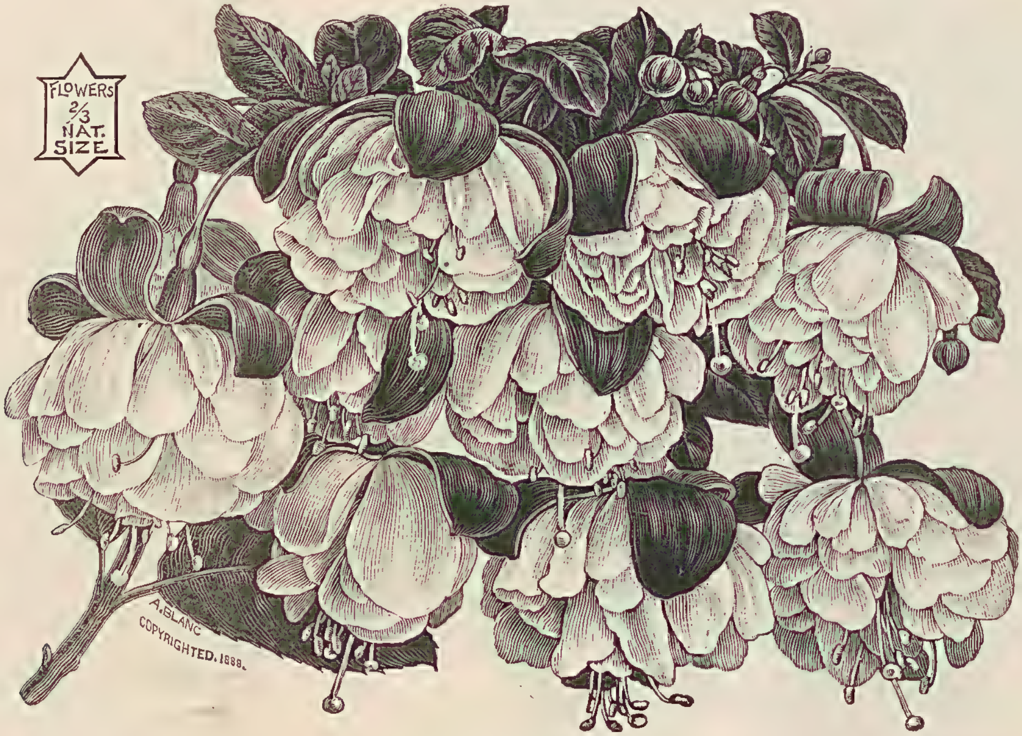
One of the hitherto unlooked-to factors in the problems pertaining to village improvement and out-door home surroundings is that of the children, but a great deal of attention is at last being given to the question in Chicago. Wherever the improvement of outdoor conditions about homes of the masses has been undertaken on a large scale, the boys and girls have been requisitioned and have brought about marvellous results, not only to themselves, but to the work they were called upon to do. And it will always be found to be a natural fact, that once get the children, of eligible age, interested in garden outdoor improvement work, and the love of nature inherent to them and the persistent effort they will make to succeed under encouraging conditions, will be a stimulant to the children of older growth who need a constant spur to keep ambition alive. The adaptability and enthusiasm of children to work out such details of improvement as come within their intelligence and strength should be recognized far more fully than it is. In the manifold directions in which village improvement societies find duties awaiting them, much of the details could well be relegated to organized child effort, and such encouragements could be readily arranged as would by creating healthy emulation, ensure the best of service. Little hands and bright eyes have through all ages been afforded affectionate recognition for usefulness and brightness, and we find as the world grows older duties to perform which are real pleasures after all, and duties in a great part of the education and character training of the child may be incorporated, and in which the little hands and bright eyes may also be made of real usefulness to the community at large.—*Park and Cemetery.*

A Pretty Table Decoration

A Scotch lady sends us the following :—"I was called in the other evening to look at a table which was just being arranged for dinner, and the effect appealed so much to my artistic taste (or what little there is left of that virtue, in these prosaic, hard working days) that I resolved to tell you all about it. Down the centre was a strip of white satin, rich and thick, on which was embroidered bars of gold, and daffodils so exquisitely worked here and there that they had the appearance of being lightly thrown into their places. In the centre stood a bowl of maidenhair fern, which I learnt was preserved—although I could not tell that it had not been freshly gathered—and at each corner there was placed a slender vase containing two or three blossoms of the same stately yellow flower and feathery fern. Here and there fairy lights were glimmering in exquisitely hammered iron stands, and each serviette was folded square, with a strap of narrow yellow satin ribbon across one corner and tied in a tiny but loose bow."

The Fuchsia.

THE Fuchsia is such a well-known florist's flower as scarcely to need description. Whilst in the two great divisions of plants, threes or fives, or their multiples, are customary, the Fuchsia favours the number four: it has 4 sepals, 4 petals, 8 stamens, and a four-celled berry. As the flower is pendant and the corolla partly hidden from above it has found it advantageous to grow a coloured calyx in order to attract insects for pollination. The Fuchsia was discovered 200 years ago by a monk, Father Plumier, who named it after a famous botanist, Fuchs, born another 200 years earlier. The native habit is Central and Southern America; there are about 50 species, of which the principal in cultivation are Globosa, Corymbiflora, Fulgens (with long flowers and tuberous roots), Procumbens, and Gracilis. The natural order to which the Fuchsia belongs is Onagraceae, so called because in some species the leaves are like the ears of the Onager or Wild Ass! Other species found in our gardens are Gaura, Godetia, Clarkia, and the Evening Primrose. The berries of the Fuchsia are edible, and so are the roots of the Evening Primrose, and the seeds of the Water Chesnut, of the same order.



"Mrs. E. G. Hill."

The Fuchsia readily lends itself to crossing. Supposing a fine shaped flower with a tolerably pure white tube, but deficient in a good corolla of the right form and colour; then take the pollen of a variety that has a good corolla, and apply it to the stigma of the one with a good tube and sepals, and save the seed. A glance down a florist's catalogue will show the numerous varieties of colour obtained: the sepals being white, crimson, scarlet, violet, &c., and the petals white, pink, purple, blue, &c. in various combinations. These varieties are obtained by crossing as indicated and growing the plants from seed.

Some varieties, too, are grown for the beauty of their leaves, such as Sunray and Meteor. The propagation is easy; either from seeds, or from cuttings about one inch long of young shoots taken off close to the old wood. Even in the Hills, where frost is not unusual, the plants will survive the winter if not allowed to get sodden.

It can be successfully and easily grown either in the open beds, the bush house, or under glass. The plant is mostly favoured for pot culture, because of the gracefulness and beauty of the blooms and the elegance of its form as a plant when carefully shaped during its younger stages of growth.

The most suitable compost is one part sharp sand, one part well-decayed cowyard manure, and two parts rich fibrous loam. Although the plant is rather a rich feeder, only occasional supplies of liquid manure should be given, and then great care must be taken not to put it in too strong. To make the young plants bushy the shoots should be stopped off when the plant has grown about, say, six or eight inches.

In pot culture the plants require to be replaced with young ones about every third year.

In the open they are very vigorous growers when properly tended, and their special delight is an eastern aspect, well sheltered from the hot winds. Here they should be well mulched with rotted manure, and growers will find them thirsty plants during dry weather.

Many growers of Fuchsias not for show purposes will keep the same plants in large pots, or in the open beds in favoured spots for years. As a rule under such circumstances the old plants become gaunt and straggley, but by judicious pruning, and afterwards stopping, in the autumn the old plants will hold their own amongst others with a fair show of blooms, indeed very fine flowers are thrown. The pyramid shape is the correct form to be worked for, and to gain this the tops should be nipped off to force out the lower branches. One of the upper shoots should be removed as soon as the lower ones have pushed a few inches, and the other tied to a stick, to be again stopped when it has advanced about a foot.

The Fuchsia is another plant which has been neglected in the matter of not being grown nearly so largely as it deserves to be (says the Sydney *Daily Telegraph.*) Plants out of doors, by reason of the mild character of the winter, are now producing nice young growths, which will answer first rate as cuttings, and if propagated now they will make very nice plants and flower well during the autumn. We have no hesitation in recommending the single varieties for outdoor cultivation, because they are hardier and freer flowering than the double, and in nearly every instance they make the better plant of the two. As a matter of fact, it is requisite that the double varieties should solely be cultivated in nicely sheltered situations.

From the single varieties we can commend Mrs. Marshall. Its tube and sepals of the flower are white, the corolla is pink, and without a doubt it is one of the very finest varieties for outdoor cultivation. Another very fine variety is the Rose of Castille, which has white sepals, with a violet corolla. White Jubilee is a variety prossessing an enormously large flower, with rich red sepals and reflexed corolla. It is altogether a grand flower, but not such a free flowerer as either of the two varieties before mentioned. The Earl Beaconsfield is a wonderfully beautiful and thoroughly distinct fuchsia, having rosy carmine tube and sepals with a deep carmine corolla. Mrs. Rundle is another very fine fuchsia, after the style of the Earl Beaconsfield. It has fresh-colored sepals and an orange-scarlet corolla. A variegated variety of the fuchsia that really ought to be grown in the flower garden, not wholly for its flower, but for its foliage, is Gracillis variegata. The flower of this fuchsia is small when compared with some of the other varieties, but it has beautifully variegated leaves, the variegation being white, and round the edge of the leaf. Of the double varieties, we would recommend Avalanche, which has crimson tube sepals with a purple corolla. It is possessed of a very distinct foliage of a palish green colour. Frau Emma Tophia is a very pretty and distinct variety, having tube and sepals of a rosy coral colour, with a clear rosy blush corolla; the flower of this variety is large, and extremely free flowering for a double. Madame Jules Christian is one of our best double white fuchsias. The sepals are short, reflexed, and of nice crimson colour, whilst the corolla is a pure snow-white. Miss Lucy Vidler has rich crimson sepals, with a bright violet mauve corolla. Molesworth is one of our largest double flowering fuchsias, having nicely reflexed sepals of a bright carmine colour, with a pure white corolla. Phenomenal is a well-known variety, having a short tube and reflexed crimson sepals; the corolla is azure violet, flaked with red.

Group of Cacti.

THERE are many subjects to which the amateur horticulturist devotes his attention. Some have a fancy for chrysanthemums, others for roses, violas, pansies, carnations, etc., and the general public, when viewing the beautiful specimens that have been produced, often from very ungenial surroundings, cannot but admire the enthusiasm shown by the cultivator; but perhaps the "fancy" which receives the least appreciation from the outsider is that of cacti culture. For it is not by a casual glance that one can discern the beauties of a Cactus, but an hour or two spent in the company of an enthusiast looking through a collection will reveal not only some wonderful and curious forms of habit, various shapes of flowers with their exquisite colours rivalling in many instances the aristocratic orchid; but also the great hold these plants have upon those who have taken them up as a hobby. No doubt there are many lovers of the cacti in various parts of Australia where the climate is most suitable for every form of these peculiar plants. Many of the blooms are amongst the most beautiful flowers that are grown.

ORNAMENTAL SHRUBS.

THE charming family of Rhododendrons, Azaleas and their kindred, will occur to any one who desires showy flowers in the shrubbery. There is no more beautiful class of plants, but unfortunately they will not thrive everywhere. Those who cannot succeed with them may console themselves with Roses and Pæonies. The so-called tree Pæonies are shrubs that will thrive in soil that is death to Rhododendrons. For the best results in growing Pæonies one must have patience, as it is only after they have been established some years that they begin to show their real beauty. They need the choicest places in the garden, plenty of sunshine, rather moist and very rich soil, often renewed. They are grand plants when well grown, and worth a great deal of trouble.

Viburnum Plicatum.

Lilacs are charming shrubs, and desirable for their beauty and fragrance of their flowers. They are propagated in many varieties, but the old-fashioned white and dark lilac kinds are as hardy and satisfactory as any, and will stand more neglect than any of the newer kinds.

Of Deutzias, the bouble-flowered pink and white Deutzia crenata is perhaps the most conspicuous. It forms a large bush, sometimes eight or nine feet in height, and is covered with bloom.

And now we come to the beautiful stranger from China which takes so kindly to our soil and climate, and which, if I could plant but one shrub, my choice would be the Weigela. It is not by any means a rare plant, and there are many varieties, all beautiful. It is quite hardy, has a most graceful habit of growth, and should be allowed to develop naturally in good soil and in full sunshine. It repays care by added beauty, but will grow and flourish almost anywhere. In pruning remember that every branch that is ruthlessly lopped away deprives the owner of a beautiful garland of bloom. In its natural state it has a half pendulous habit of growth and should not be tied up or cut back. Remove dead limbs or those that interfere or mar the symmetry of the plant. Otherwise let it alone. If it can be given plenty of room to develop naturally it will never be an unshapely object.

One of the best qualities of the Weigela is the time of its flowering, and another is the duration of its bloom. It comes into bloom after the early shrubs have faded, and fills up the interval before the coming of the rose. It continues to flower for several weeks, and some varieties, such as Weigela nivalis give us a few blossoms throughout the summer.

New varieties are being introduced all the time. We have not tried them all, and must warn amateurs that so-called improved varieties are seldom as hardy and not always so manageable as the types from which they are derived. For general planting we know no Weigelas superior to W. floribunda, W. rosea, W. nivalis, W. grandiflora and W. Hortensis

Exochorda grandiflora is another very conspicuous flowering shrub. It attains a large size, but is not in this country a very long-lived plant and seldom sets any seed, so that it is still rather scarce. We have planted two groups of Exochordas in prominent places where we needed a "high light" in the landscape. Each group consists of three plants forming an irregular triangle, the bushes about six feet apart. They grow tall and rather straggling, with slender irregular branches, covered with an abundance of quite large paper-white blossoms. The flowers are more delicate than the trumpet-shaped bloom of Weigelas, and do not last so long.

The Snowball is a very familiar example of the conspicuous shrub, but should be used with care as it does not harmonize with smaller flowers. Neither does it look at home in the wilder and more woody parts of the park or home grounds. Its place is near the house or in the old fashioned garden, or on the well-kept lawn, where groups of snowballs, pruned into symmetrical shape, are very effective.

All the Viburnums are fine shrubs and should be planted more than they are. V. prunifolium, the Black Haw, is very beautiful in bloom. It has recurving, spreading branches, plum-like leaves, and numerous clusters of white flowers in spring. All Viburnums, except the two "Snowballs," are adapted to the wilder parts of the grounds, though some of them, such as Viburnum molle and Viburnum pubescens, make fine specimen plants for the lawn. V. molle flowers at midsummer.

Perhaps the most beautiful of the hundreds of shrubs is a tall, stately specimen of Xanthoceras sorbifolia, which may almost be called a small tree. About 10 feet in height, it is clothed down to the ground with branches that put on a fairy like garment of softest white bloom. The blossoms come before the leaves have fully expanded, and are large, bell-shaped and upright in habit of growth. They are white, with luminous greenish-yellow centres, and these centres have the singular faculty of deepening day by day during the blooming period, first to lemon yellow, and then gradually changing to an unusual shade of deep salmon red. The flowers last in perfection a week or ten days, and the little tree is the glory of the garden until it fades. We hope to see this very beautiful shrub more generally planted. It withstands our severest winters uninjured. It has fine foliage, of a clear, light green, and is an exceedingly ornamental plant even when out of bloom.

All the Hydrangeas have large showy flowers. The best among the hardy kinds are the oak-leaved Hydrangea, a noble shrub, and the very familiar H. paniculata grandiflora.

Flowering Quinces or Cydonias are beautiful obects in the spring, especially the bright scarlet and the pure white kinds. Cydonia Moerlosii has exquisite flowers of shaded carmine, and there are varieties that have bloom of a conspicuous orange-red, such as Cydonia aurantiaca, which ought not to be planted near Lilacs or shrubs with rose-pink flowers.

We have mentioned the most ornamental of this class of plants, but there remains much to be said on the subject of conspicuous small trees and vines. This will have to be deferred to some future day. —*Park and Cemetery.*

A Few Hints for the Glass House.

GLOXINIAS AND BEGONIA REX.

REX Begonias are benefited by shading at all times, although very little is required in winter time, merely placing them in a shady part of the greenhouse. A thin shading will suffice during the early part of spring, but as the sun becomes more powerful, especially during the summer, it will be necessary to use a thicker shading. A night temperature of 60° is required during the winter months. During the summer established plants, which need plenty of air day and night, can be placed out of doors in some sheltered, shady place. Rex Begonias require a rich porous soil, composed of two parts loam, one part leaf mould, one part rotted manure, one part sand and a little lime.

Gloxinias, when started, require a night temperature from 65° to 70° with a rise of 5° to 10° in day time. They will require very little water until they begin to grow freely. Maintain a moist atmosphere in the house. They are more easily watered when placed on shelves erected on the greenhouse bench, the highest shelf at the back, with a gradual slope to the walk similar to a flight of stairs; besides you are less liable to wet the foliage when watering, and that is one of the essential things to avoid if you want to grow good Gloxinias, especially if you use cold water from the hose. I prefer to use the watering pot when watering Gloxinias and water under the leaves. Wet the benches occasionally to keep down thrips. The soil should be one part fibrous loam, one part half-rotted leaves, a sprinkle of sand, a little fine rotted cow manure with thorough drainage. When growth has started the plants will need shading lightly by spraying naptha and white lead on the glass. As the sun gains in strength use lath shades over the painted glass. When coming into flower water with weak liquid manure occasionally. When in flower remove to a cooler house where more air can be given but avoiding cold draughts. When through flowering the plants can be placed outdoors in a frame where they can be protected from heavy rains. They can be stored in a warm, dry cellar in winter, or the pots can be placed on their sides under the greenhouse bench. Keep them dry until time to start again.—ROBERT SHORE.

The Pope as a boy was an ardent gardener, and especially delighted in raising vines from grape stones. Double Violets were popular among his pot plants.

Mr. George Meredith loves to see a house covered with creepers, and has a particular liking for tall herbaceous plants. The wilder and more natural the growth of garden plants the better is the novelist pleased.

The Attractiveness of Plants.

IN most instances this depends upon the shape and colour of the corolla, but in such cases as the Fuchsia the calyx must be credited with a large share of the conjoint beauty. In the Bottle-brush the petals are inconspicuous, and the colour is furnished by the red filaments of the anthers. The exsertile stamens of the Caper and of the Poinciana are main factors of attractiveness, and the Bougainvillaea depends upon its coloured bracts for its brilliancy. The variegated leaves of such plants as Holly, Beet, and Pelargonium, and the autumn tints of Maples, Vitis, and Sumach contribute their charm. The coloured fruits and berries of Pomegranate, Arbutus, Pyrus, Snowberry, Berberis, and others entitle them to a place in our ornamental garden.

Even the inflated coloured calyx of Physalis, the branches of the Golden Willow, and the curious stems of the Cacti, have a claim to our regard. Apart from colour the leaves of Grasses and the fronds of ferns are a never failing source of delight.

Even when the flowers of a plant are small and uncoloured a grand effect is produced at times by the immense number of simultaneous blossoms, as in the Snowy Mespilus.

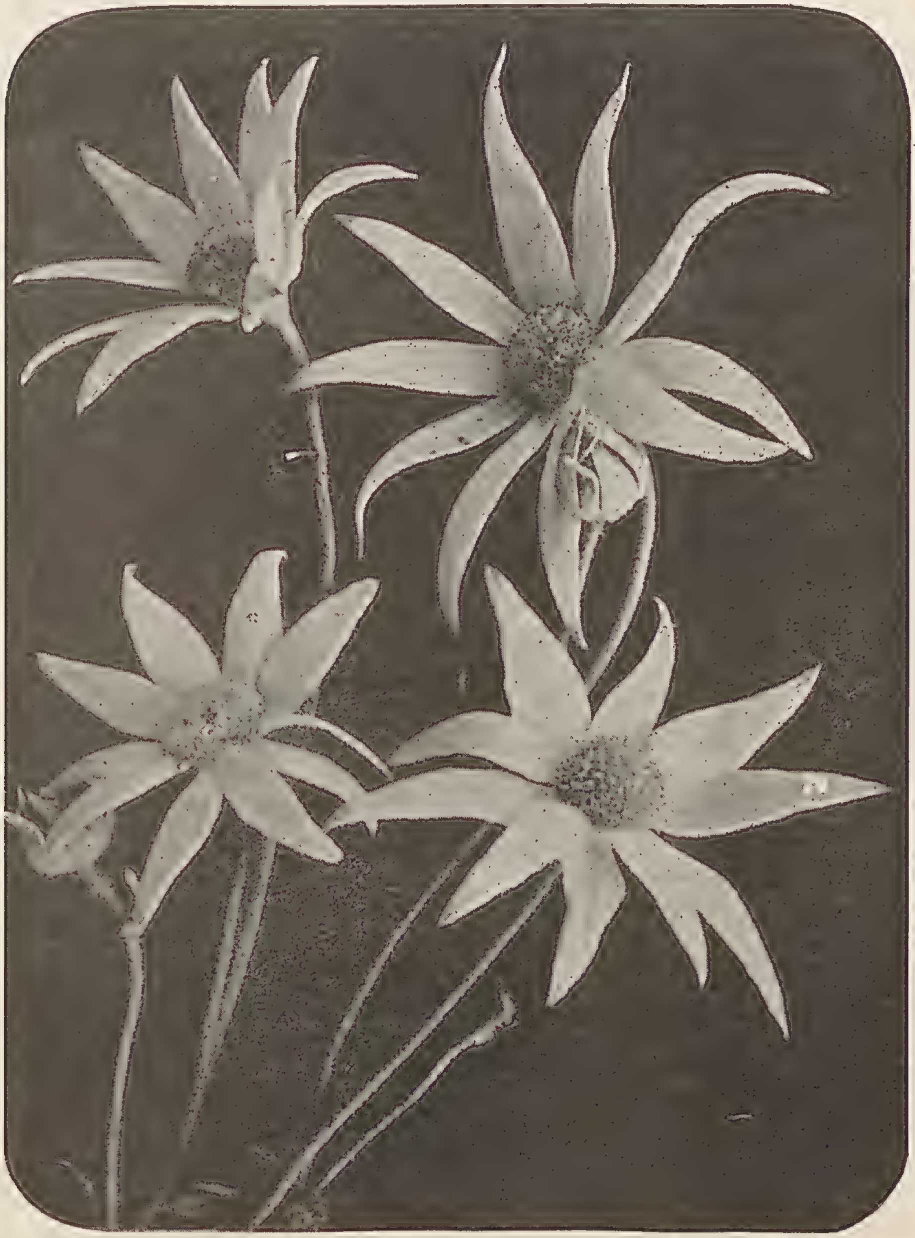
If we turn to another sense we find numerous plants grown for their perfume, either of flowers or of leaves. We need only instance Daphne, Rose, Magnolia, Lippia (miscalled Scented Verbena), Viola, Rosemary, Lavender, and Boronia.

Japanese Fern Ball.

IT is now nearly twenty years since these were first imported into England, and among the earlier importations were some made up in various fantastic designs, but within the last few years these have been imported in larger quantities and in greater variety of designs. Some of them are, perhaps, more curious than beautiful, many of the fancy designs being very effective; but it is the round balls which prove the most satisfactory, these being better suited for holding moisture and for the roots to penetrate. Davallia Maviesi is used for making these designs, but it is now often referred to as Davallia Bullata. The true D. Bullata has thicker rhizomes, densely clothed with reddish-brown scales, and in D. Mariesi the rhizoms are slender, and on the point of the rhizome the scales are slivery white, changing to grey. The slender rhizome are flexible, and adapt themselves well to twisting round and making the various designs. They also possess much vitality. It is a deciduous fern, and is imported while destitute of fronds. It often comes to hand in a very dry state, and it is surprising how soon they start into growth when moistened and placed in a little warmth. If properly cared for they will make better growth the second year than when first imported, aud although better known in the form referred to above, it makes a good pot plant. When the frouds ripen they change to a pretty bronzy yellow, and are often used in various floral designs.

The Flannel Flower.

(*Actinotus Helianthi, Labill.*)



WE take a description of this native plant, so abundantly plentiful around the coast of New South Wales from Mr. J. H. Maiden's most excellent and beautiful work, "The Flowering Plants and Ferns of New South Wales." This work we commend to every student of botany, and all who are interested in the botany of Australia, indeed, to every lover of beautiful flowers, because the letterpress is profusely illustrated with most beautiful and correctly coloured plates.

Vernacular Names.—We only know one truly local name for this plant, and that is the "Flannel Flower"—a rather unpoetical designation, but a really descriptive one, and one universally accepted. It is, of course, in allusion to the involucre, which looks as if it were snipped out of white flannel. It is also known to a few by the name of Australian Edelweiss. The true Edelweiss is found on the Alps of Europe, and its botanical name is *Leontopodium alpinum.* It belongs to the Daisy family (Compositae), to which our flannel flower does *not* belong, as we shall presently see.

Botanical Name.—It was called *Actinotus Helianthi* by Labillardière, the celebrated French botanist, who visited the eastern and southern coasts of Australia (including what is now known as Tasmania) during the latter part of the last century. The generic name *Actinotus* is from the Greek *actinotos*, radiated, in reference to the rayed appearance of the involucre, *i.e.*, what people often call "petals" in speaking of the flannel flower, but whether correctly or not will be evident later on. The word is akin to a Greek word which signifies the rays of the sun. The specific name *helianthi* is from *helianthus*, the botanical name for the sunflower, which word is again derived from the Greek *helianthes*, a sunflower. The name, therefore, is in allusion to the general resemblance of the flannel flower to the sunflower.

Botanical Description.—Erect, perennial, 1 to 2 feet high, covered with a soft dense almost floccose or woolly tomentum, rarely wearing off from the upper sides of the leaves.

Flowers.—There is a little catch in regard to the botany of the flannel flower. Does it not belong to the daisy family (*Compositae*)?

Certainly not. But does it not possess an external resemblance to many members of that family? Indeed it does. It, however, belongs to that natural order whose members have their flowers in umbels (Umbelliferæ). Our flannel flower is, therefore, closely related to the carrot, parsnip, celery, and other prosaic plants, and not to the daisy, of which the minor poets love to sing. Let us explain. Take a flannel flower. Pull the so-called petals off, for they are in the way. We then have a soft woolly hemisphere, which consists, not of one flower, but of a very large number closely packed together. Either cut or pick away half the flower-head. Even by naked eye it will then be seen that the flower-head is as stated, and it will be observed that the tiny flowers all radiate from one point, like the spokes of an umbrella. If you are ever in doubt as to what an umbel is, always think of the spokes of an umbrella. Of course, in the case of the flannel flower, where the individual florets are so minute, the stalks of the umbel must be even more minute; in fact, they are so small that beginners overlook them altogether. It is best to examine this flower with a magnifying glass if one is handy, but this is not necessary to anyone with good eyesight, who can easily make out the parts with the naked eye. Most of the little florets have anthers, which can be seen to be more abundant towards the circumference (periphery) of the flower-head, where it is yellow, than towards the middle. When the flannel flower is fully out, and has not run to seed, this can be made out readily by the naked eye.

Just one other note about the flower. It may be that some of our readers scarcely thought we were serious in throwing doubts upon the "petal" being petals. But the fact of the matter is, the flannel flower has no petals. If you were to put the most searching power of the microscope on to these little florets we have been speaking about, you would find no petals.

The "petal" of the flannel flower are *bracts*—that is to say, each "petal" is a bract—and the whole of them, the whole "star," is collectively known as an *involucre*. A bract may be described as a floral leaf, and it is not an essential part of the flower. The gaudy crimson part of the *Poinsettia* so often seen in gardens consists of bracts, the flower proper being comparatively inconspicuous.

The flannel flower not infrequently shows good examples of what is known to botanists as "floral prolification," and popularly as "hen and chickens." Six to eleven (and even more) small heads of flowers, each on pedicels, and surrounded by say six bracts, often grow out of a common involucre.

In this connection it may be desirable to allude to the fusion of parallel shoots known as "fasciation." Often what appears to be the stalk of the flannel flower is apparently flattened out to a ribbon more or less wide. We have seen them as much as 4 inches wide, but fasciated stems half an inch wide are common. This phenomenon is usually accompanied by floral prolification.

Distribution.—From Gippsland to Southern Queensland. It is particularly abundant in New South Wales, where it is apparently confined to the coast district, the dividing ranges, and the table-lands. Found usually in the most sterile soil, though not exclusively so.

Propagation.—The amateur will not find it easy to propagate the flannel flower. Our experience is that the fruitlets do not readily germinate, but it may be propagated from "seed" or fruitlets. Another method is by dividing the plant, but no matter what method is adopted it is not easy to ensure success.

THE MAGNOLIAS.

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THE North American trees composing the genus Magnolia are certainly among the most splendid productions of the forest in any temperate climate, and when we consider the size and fragrance of their blossoms, or the beauty of their large and noble foliage, we may be allowed to doubt whether there is a more magnificent and showy genus of deciduous trees in the world, with the exception of a few shrubs or smaller native trees of China and the mountains of Central Asia. It belongs exclusively to North America, as no individual of this genus is indigenous to Europe or Africa. The large evergreen Magnolia (M. Grandiflora), or Big Laurel, as it is sometimes called, is peculiarly indigenous to North Carolina, where its trunk often grows seventy feet in height, carrying a superb pyramid of deep green foliage which renders it one of the loveliest and most majestic of trees. The leaves, which are evergreen, and somewhat resemble the Laurel in form, are generally six or eight inches in length, thick in texture, and brilliantly polished on the upper surface. The highly fragrant flowers are composed of about six petals, opening in a wide cup-like form, of the most snowy whiteness of colour, scattered among the rich foliage. Their effect is exquisitely beautiful. Several varieties have been raised from the seed of this species in England, the most beautiful being the Exmouth Magnolia, with fine foliage, rusty beneath. It produces its flowers much earlier and more abundantly than the original sort.

The Cucumber Magnolia (M. Acuminata), is so called from the appearance of the young fruit, which is not unlike a green cucumber. This species, which is also a native of North America, attains a height of 70 to 80 ft. The leaves are deciduous, like those of all other Magnolias, except M. Grandiflora, about six inches long and four broad, acuminate at the points, and of a bluish green on the surface. The flowers are about six inches in diameter, of a pale yellow, much like those of the tulip tree, and slightly fragrant. This noble tree is destined to become a great favourite with us on account of the excellent shelter it will afford.

The large-leaved Magnolia, M. Macrophylla, is not known in Australia. It is one of the rarest of the genus. The leaves grow to an enormous size when the tree is young, often measuring three feet long and nine inches across. The flowers are also immense, opening out to the size of a hat crown, and diffusing a most agreeable odour. This handsome species would only grow in the colder parts of Australia—in places like the Mount Lofty Ranges, S.A., Mount Macedon, and Ballarat, Victoria.

The Chinese Purple Magnolia (M. Purpurea), which produces an abundance of large delicate purple blossoms early in the spring, attains a height of about 4 to 6 feet. It has been proved to be hardy on the plains and other districts in Australia.

The Yulan or Chinese White Magnolia (M. Conspicua) is one of the showiest of the small growing Magnolias. It is a most abundant bloomer, bearing beautiful white fragrant flowers in September before the leaves appear. It is quite hardy. M. Soulangeana is a hybrid between the foregoing, with large flowers, delicately tinted with white and purple.

Magnolia Stellata is another very showy Japanese species. It is a dwarf grower, and very profuse bloomer. Flowers are about 4 in. across, the petals being narrower and more numerous than in the other known varieties.

The Magnolias in order to thrive well require a deep rich soil. In nearly all cases, to secure luxuriance they should be improved by adding a little decayed manure, and occasionally watering during the heat of summer. All the Magnolias are such superbly beautiful objects upon a lawn, especially when they are clothed with luxuriant foliage and large odoriferous flowers, that they need no further recommendation to ensure their regard and admiration from all persons who have room for their culture. If possible, situations somewhat sheltered either by building or trees should be chosen for all the species, except Magnolia Grandiflora, which thrives well in almost any aspect.—M

THE POCKET LENS IN BOTANY.

Many students accustomed to the compound microscope and elaborately mounted specimens fail to see how much can be done with a simple lens. The best is Browning's Platyscopic, but, failing this, an ordinary doublet is of service. Armed with such a lens the component parts of a flower can be examined and its genus determined by Thonner's Key, and the species then traced by reference to larger works. But let us suppose that the student wishes to confine his observations to one branch, say leaf-hairs. He will naturally wish to keep his specimens in a convenient and permanent form. The following procedure is recommended:—Take a sheet of thick cardboard and rule it off into divisions 3 in. by 1 in. With a half-inch gun punch cut out the centre of each division. Then paste on the back a thin sheet of cardboard, finally cut up into separate slides. (These will look better if, before being separated, an inner margin has been ruled to form a frame.) The slides so prepared are, in fact, shallow cells into which discs of the leaves, cut with the same punch, are to be placed and gummed down. Next take pieces of half-inch wood, 6 in. by $3\frac{1}{2}$ in., and nail round them strips of card $1\frac{3}{4}$ in. high: these will form trays to hold the slides, and can be kept covered from dust by another strip of card.

The specimens should be kept sorted according to genera, and indexed on the cover, and the names should be written lengthwise on the left-hand end of the slide. The collection will gradually grow and become more and more interesting. Of course, Ferns may be similarly mounted to show sori and spores.

CYCLAMENS.

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AN interesting article on the Auricula appeared in the *Gardeners' Magazine* from the pen of Mr. J. Douglas, a specialist, who gives some practical information upon the subject. He says:—

Many persons fail to grow the Auricula (Primula) to anything like perfection, and, for my part, I have been many times puzzled to know why even good gardeners seldom have a collection of presentable plants of this lovely spring flower. I read somewhere (when I was a young gardener struggling upwards) of a gentleman who was complimented by a friend on the handsome pine-apples in his garden. His remark, in reply, I have never forgotten. "Yes, the pines are very good; we can grow pines, but we seldom have a good cabbage." The remark taught me to attend to all the minor details of the garden.

Amongst the "small potatoes" we may class the Auricula, and I fear it is very often overlooked, not being important enough for the attention of the gardener. For a week or so after repotting, the lights must be kept over the plants, affording ventilation at the back; if this is not done the leaves flag, and many of them decay. As the result of much experience, I have entirely given up the use of artificial manures for the Auriculas. The last I tried was powdered bones (if this may be termed artificial manure), but even used in very small quantities a gross growth was produced, causing a lack of refinement in the flowers; for whether it is the show Auricula or the section termed alpine, refinement is absolutely necessary.

A considerable degree of ignorance still prevails as to the distinction between show, fancy, and alpine Auriculas. In the first place, it is necessary to define the first parentage. The show and fancy varieties have descended from the Alpine Primula Auricula, and the alpines also from an Alpine plant, Primula pubescens. There are other species of Alpine Primula that may well be claimed as progenitors of our garden Auriculas.

Alpine Varieties.—There is really not nearly so great variety among the Alpine Auricula, but for exhibition purposes there are two sections—the gold-centred varieties are in one, and the cream or white-centred in the other. Those with yellow centres have the margin marone shading to red, and even crimson of various shades, while the cream-centred varieties are purplish-marone, or marone shading to various tints of purple or lilac-purple. This almost points to a different specific origin. The object of the hybridist is to obtain more varied colours in this section, and, indeed, within the last few years we have several of quite apricot and bronze tints.

Cultural Remarks.—These need not be very long. The repotting and such details are not different from that of other plants. To three or four parts of good loam add one of decayed manure and one of leaf-mould. This makes an excellent potting soil. The flower pots require good drainage, and pot firmly; but do not use large flower pots. Even for vigorous growers I do not care to use larger sizes than four and a-half inches diameter inside measure. Some persons have an idea that the fanciers of sixty or seventy years ago knew better how to grow Auriculas than the fanciers of these degenerate days. This is an error, founded in ignorance of the treatment meted out to the plants by the old-time florists. They made two serious mistakes; they used a compost that was far too rich, and flower pots very much too large. A noted florist advises the "following compost for strong blooming plants of Auriculas:—One barrow of sound staple loam, one barrow of dried nightsoil, two barrows of sheep, cow, or poultry manure; mixed in blood from the slaughterhouse in equal quantities." Any practical gardener could guess how long the "strong blooming plants" would remain strong after being potted in such a mess.

Seedlings.—Many amateurs fancy that if they purchase a packet of green, grey, or white-edged Auricula seed, that the seedling plants will be of the same type. This is also an error, for a large proportion will be selfs, some will be nondescripts belonging to no class, and may be placed amongst the fancies if good enough. As soon as the plants have formed the first leaf, after the seed leaves, they must be pricked out; but it must be noted that some of the seed will not germinate for six months, and some of it perhaps not for a twelve month or more. The plants must all be grown on in garden frames, and be freely ventilated. The treatment of Alpine Auriculas, if grown in flower pots is the same as that for the show section, but they are certainly more hardy and easier to grow well; but, being so hardy, they may be grown out of doors; and all of them are well adapted for culture in the rock garden, where they become established and produce fine masses of bloom.

Planting Window Boxes.

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MOST householders expend considerable sums of money, time, and care upon window boxes filled with flowers that so nearly resemble those of most of the neighbours that passers-by, their eyes satiated with red, white, and blue or yellow colours, are really quite unable to appreciate the costly display. Geraniums, white marguerites, blue lobelia, and golden calceolaries are very pretty; but, when half the house-fronts down a street show these flowers, in the same mixtures, familiarity breeds weariness, if not contempt.

At this happy season of the year, when tempting offers of cheap plants for bedding-out are overwhelmingly numerous, it should become a delightful exercise for the gardener's skill and taste to choose plants for his window that shall be at once lovely, lasting, and uncommon. Nor need he seek after real novelties; it is easy to make uncommon efforts by the use of quite ordinary plants, which, however, happened to be seldom employed in this particular service.

Hydrangeas are among the best flowers possible for window decoration, either in sunshine or shade, where their height is not a disadvantage. The pink kinds do best in sunshine, the white in shade, so, to avoid a cold effect in shadow, the rest of each box where the white are used should be planted with scarlet or pink-flowered or red foliaged plants. Of the last named coleuses are suitable for use during genuine summer weather, and Chilian beet may be relied upon. Red begonias are well adapted for growing with white hydrangeas. The pink hydrangeas look lovely among bright violet or purple violas.

For window boxes to be filled with low plants, in order not to darken the rooms within, fairy roses on a carpet of pale blue nemophila are not easy to improve upon. Pale pink asters with deep pink verbenas, to hang over in front, or the crimson-flowered ivy-leaved geranium, give a bright bit of colour. The so-called yellow asters and golden pansies will do for a shady spot. Perhaps amateur gardeners experience most trouble in directing what to grow in extremely sunny hot windows. Where a striking effect as is produced by one, or at most two, colours is not required, a sowing of portulaca, among somewhat closely-set plants of salpiglossis. Among white Anemone coronaria The Bride is very charming. African marigolds do not mind the sun heat, but I would much rather see the more graceful and artistic golden doronicums, which will continue in flower a long time if kept well watered and robbed of all their fading blooms.

Dwarf Antirrhinums in separate colours are most suitable window-box plants. One charming arrangement is made by letting a few royal blue cornflowers rise from among dwarf lemon snapdragons. Iceland poppies, mixed, with the mist-like grass, Eragrostis nebulosa, or the popular gypsophila will be found pretty and scarcely any trouble. Few persons seem to use little else but Ferns in their boxes, yet against a red brick house this is a scheme of adorment that leaves little to be desired. It is satisfactory, in a shaded place, to use ferns with just a few plants of palest pink or white Begonia semperflorens.

All purple and mauve flowers suit sunny boxes against a cream-painted building. Verbenas, asters, violas will give the colours, or purple jacobæa and purple cornflowers. White dwarf cornflowers, with tall calliopsis in a bright gold kind, looks best if the quaking grass, Briza maxima, is used also. Potentillas are satisfactory where brilliance is not desired. The small white rosette-flowered Chrysanthemum inodorum may be combined with a salmon-blossomed geranium, either double or single, mignonette, and the royal blue dwarf delphinium, or phacelia will delight those who pass, or those who dwell within the house; while white petunias and the ordinary yellow stonecrop, with some trailing smilax, will be sure to prove pleasing and lasting.—*Amateur Gardening*.

Madame Sarah Bernhardt once said, "A fruit garden in spring is the garden I most admire."

SCIENTIFIC.

THE FLOWER.

THE FLOWER BUD.—Before the floral appendanges become separated to form the fully opened flower they are packed closely together and form the bud. The manner in which the parts are arranged with respect to one another in the bud is called the æstivation. In the Poppy the petals are crumpled up into a small space in a very peculiar manner. When fully expanded they are perfectly smooth. It may be Valvate, Induplicate, Reduplicate, Twisted, Imbricated.

Calyx—The outermost envelope of the flower is called the calyx (or cup.) It consists of sepals which may be of various shapes; the edges may be cut into curious appendages, as on the Rose; or hooked; in the Hibiscus it is double. Sometimes the calyx falls off before the flower is expanded, as in the Poppy, or along with the corolla (deciduous); or remains (persistent). In Eschscholtzia and Eucalyptus the parts remain united at the upper part and become disarticulate at the base, so as to come off like a lid or extinguisher.

Corolla — This envelope is generally coloured, conspicuous and odorous; it is seldom green (except in Fabiana). The colouring matter is contained in cells, and is entirely different from chlorophyll (the colouring matter of leaves.) Hairs are sometimes found on the corolla and rarely stomata. Generally the corolla is thin, but in Stapelia it is thick and fleshy. Like leaves the petals (or parts which compose the corolla) may be of all shapes—lobed, toothed, fringed, heeled, &c. Rarely the number of petals is one, but usually equals the number of sepals. The ground-up petals of the Pyrethrum roseum are used to make insecticide.

Stamens—The male portion of the flower consists of stamens, which vary in number from one to hundreds; they are undoubtedly modified leaves, and are generally a multiple of the number of sepals. A stamen is made up of two parts, the filament and the anther. In the pea tribe nine are united into a tube, while the tenth is free; in Stylidium jointed and sensitive. In Orchids the filaments are united with the pistil to form a column. Anthers consist of cells containing pollen, the grains of which are of all shapes and sizes. In Orchids it is in masses on a kind of stalk. Tetratheca has a four-lobed anther. In Salvia the anther lobes are separated by a stalklike arrangement. The lower lobe of each anther is set across the entrance to the tube of the corolla and has no pollen, *i.e.*, abortive. The upper lobe, owing to the ingenious fashion in which the anther is pivoted, descends on to the back of a bee as it pushes its way into the corolla tube. The pollen from the upper anther is thus carried away by the insect to another flower for purposes of cross fertilisation.

Pistil—This comprises the ovary (or seed vessel), the style (or column), and the stigma or head, which may be of various shapes; in grasses it is feathery. Incidentally it may be mentioned that saffron—a colouring material—is made from the yellow stigmas of the Saffron plant, 4,000 plants being necessary to supply 1 oz. of saffron.

The size of flowers varies considerably, one may be one-thousandth part of a foot only in diameter, while in the case of the Rafflesia the circumference is 9 ft This latter flower is found in Sumatra, it has no stalk or leaf, and is found growing on the roots of another plant, *i e*, it is parasitic and like a fungus. It has a putrid odour when full blown, weighs about 15 lbs., and the cup holds from 10 to 12 pints of water. An Orchid recently exhibited at a Show had petals with long appendages which measured nearly 2 ft. in length. Some flowers bloom for many days in succession, others for a few hours only and fall off at a fixed hour. The Iris Susana (so an observer informs us) blooms on exactly the same date every year, irrespective of the dryness or otherwise of the season. The buds of Cistus and Flax expand at 6 a.m. and wither before noon. The Cereus blows at 7 p.m. and closes at midnight. The blooming of flowers is held by many to be useful for the purpose of forecasting the weather.

In the process of fertilization, pollen from the stamens is transferred by different agencies to the sticky surface of the stigma; fine thread-like processes travel down the style to the ovaries, and as a result seeds are produced. This transference of the pollen may be brought about by (1) the pollen dropping from the anthers on to the stigma in the same flower; (2) by the agency of the wind blowing the pollen, or (3) by insects carrying it from flower to flower. Self-fertilization, or the transference of pollen from the anthers to the stigma of the same flower takes place in some cases, but just as in the animal kingdom blood marriages are detrimental, so self-fertilization in the vegetable world produces plants weak and sickly. Cross-fertilization, or the transference of pollen from the anthers of one flower to the stigmas of another (generally on different plants) results in strong, healthy plants. It is a well-known fact that self-fertilization is the exception and cross-fertilization the rule amongst plants, and the devices adopted, so to speak, by flowers to prevent the former and encourage the latter are truly remarkable and ingenious. Evidence in the vegetable kingdom goes to prove that self-fertilization was the original and only means by which plants were reproduced in the early days of the world's history; cross-fertilization is the outcome of evolution, and is a much more highly developed system and one which tends to produce plants more and more suited to environment. The chief agents in the process of fertilization are insects which unconsciously carry pollen while seeking their food. Plants are indispensable to insects and insects to plants. In the process of evolution insects have become better fitted for obtaining food from plants, and the latter have become more perfectly adapted to the requirements of the insects. "In general, different groups of insects, according to their sense of taste or colour, the length of the tongue, their movements and dexterity, have produced various odours, colours, and forms of flowers; insects and flowers have both progressed towards perfection," says one writer.

The subject of fertilization is a most fascinating one, and one which will lead the naturalist who studies it to marvel at the apparent intelligence of plants. In another article we shall dwell at length on the cross-fertilization "devices" which are to be found in almost every flower around us. Professor Henslow is at issue with most scientists of the present day on the subject of fertilization. He maintains that self-fertilization is the rule and not the exception amongst flowers, and cites a great number of examples. He also holds that Darwin was entirely misled by his own experiments, and illogical; that cross-fertilized plants may for a time (as Darwin showed) thrive and be stronger but eventually decline, while self-fertilized ones, which are at first weak, gradually improve. We do not ask our readers to believe either theory. If they are anxious to settle the matter in their own minds and turn attention to the literature of the subject perhaps they may be able to decide who is right.

Pronunciation of Plant Names.

MANY amusing anecdotes have been told of the mispronunciation of the names of flowers by uneducated gardeners, and small blame to them, seeing that most of the words are Greek or Latin If the English alphabet had distinct long and short vowels few of these errors would occur, but it is generally a matter of guesswork, and wrong guesses have become perpetuated. Strictly speaking the "o" is long in Anemone and Argemone, but it would be pedantic so to call them. Dahlia should have the first vowel pronounced as in father; Dalea is a different plant. Erica and Iberis require the "i" and "e" long respectively. Gladiolus should have the "i" long and the "o" short. In Clematis and Cyclamen the "a" is short. In Tecoma the first vowel is long, the second short. In Tropaeolum and Pittosporum the second "o" is short. In Niphetos the "e" is short; and the "i" of pudica is long in the name of the sensitive plant, Mimosa pudica, and in the rose Thalia. In Kniphofia, the Red-hot Poker, the "p" and "h" are pronounced separately. The "g" in words derived from the Greek is hard, as in Geum, and the "ch" like k." "X" at the beginning of words is sounded as "z," as in Xeranthemum.

The United States Experiment Stations.

America is the land of wonders. So wonderful, indeed, are the products of every form of industry that the comparatively young American nation is a phenomenon in the national history of the world. The conservative Englishman looks askance with lifted eyebrows at most things American, and "Yankee notions" is a phrase of ridicule amongst many. In spite of ridicule and incredulity on the part of the Britisher and all other nations, however, the American nation has always to be reckoned with in every phase of Empire relationships, whether commercial, political, or any other consideration. After all, it is not in the least surprising that the world turns to America for information upon everything. Her success in competing in the world's markets demands a reason and an explanation. The reasons and explanations are invariably wrapped up in two words—"natural resources." We offer the suggestion, however, that this refrain is two for the Britisher and only one for the American. We mean that comparisons are an excuse for the lack of enterprise on the part of the Britisher, who fain would say that if they had the natural resources of the Americans everything would be different. While we do not wish in the least to disparage the Britisher we cannot help feeling, in common with every other unprejudiced section of critics, that the natural resources of America are only equalled by the resourcefulness, enterprise, and energy of the people themselves.

In no feature of their nation building is this more apparent than in her production from the soil. This is due to the magnificent organization of her agricultural departments. The Government stops at nothing in the matter of expense, and in the eduaction of their people to win riches from the soil. Every dollar they spend in this direction pays and repays itself over and over again, and it would be well for Australia to follow more closely the example of the Americans in this respect. For this reason we feel bound to draw the attention of our readers to one phase of the work carried on at the United States Experimental Stations. Our references must necessarily be somewhat prescribed, as "The Australian Gardener" can only take in matters bearing within its scope. But we have not the smallest doubt but that we shall find in that scope information that cannot be obtained elsewhere which has not hitherto been brought under the notice of gardeners.

In each of the States there the Government have an experimental station, and in some States two. These stations are worked upon an organised system from the central stations, and are controlled by a staff of first-class scientists and practical workers. The work at each station is carefully and systematically chronicled and reported in every detail to the head station. These reports are printed and finally condensed into a complete record, printed and published for the general information of producers. Nothing can possibly escape the vigilance and scientific scrutiny of these experimentalists, and the information thus circulated is of incalculable benefit to gardeners, agriculturists, horticulturists, viticulturists, pastoralists, and, indeed, every conceivable industry of work dealing with production from the soil. Here, in reality, we find one of the chief factors of American greatness.

The editors of "The Australian Gardener" are gratified to think that they are now in a position to supply, monthly, to the readers of this journal, information culled from such a splendid source of reliable, useful, and interesting records. As large space as possible will be devoted to this work.

Soil Test for Onions.

A soil test with onions was continued this season (1901) with some fertiliser applications used the previous year, i.e., different combinations of nitrate of soda, dissolved boneblack, and muriate of potash at the rate of 320, 640, and 320 lb. per acre respectively. This year the limed portion of the plat, which yearly received the mixture of all three fertilisers, yielded nearly 500 bushels per acre of well-cured onions, while the unlimed portion produced only 136.9 bushels. Good crops were obtained only on those plats which received annual applications of potash. The limed portion of the plats yearly manured with muriate of potash alone produced 383 bushels per acre, as compared with 311 bushels for nitrate of soda and potash, and 380 bushels for dissolved boneblack and potash. The effects of potash far exceeded those of either of the other elements. The results further show that the use of muriate of potash makes the employment of lime absolutely necessary. Applications of muriate of potash and nitrate of soda without lime proved injurious. All plats received a ton of lime per acre.

Experiments with Potatoes.

The average results of the experiments with potatoes for several years at Ontario indicate that Empire State, Pearl of Savoy, American Wonder, Dempsey Seedling, and Rural New Yorker No. 2 are the best general varieties. Daisy, Rose New Invicible, Paris Rose, Irish Cups, Bovee, Six Weeks, White Elephant, and Ohio Junior yielded over 220 bushels per acre this season. Sprinkling cut seed potatoes with gypsum or land plaster increased the yield 16.4 bushels per acre. Cut potatoes planted on the same day they were cut yielded about 18 bushels more per acre than those planted four, five, and six days after cutting. The results of the distance experiments were in favor of planting 26½ in. apart, with the sets 1 ft. apart in the row. Planting one set in each hill gave a better yield than planting two or four sets per hill.

Regarding the selection of seed potatoes, a Dakota report states that from four varieties of potatoes—Sunlit Star, Dakota Seedling, Trumbull, and Early Ohio—the largest and best nearly round and typical long-shaped tubers were selected from the bin and planted. The results obtained confirmed the previous conclusions that for form and quality of tuber the selection must be made in the field from the vine. It was found better, however, to select from the bin the shape desired than to make no selection at all.

Experiments with Fungicides upon Potatoes.

The author, Mr. C. D. Woods, of the Maine Station report, gives a series of experiments to demonstrate the value of Bordeaux Mixture when applied on a large scale, and also as a comparison between freshly prepared Bordeaux Mixture and some of the ready preferred fungicides on the market. The plats were given four sprayings with a freshly prepared Bordeaux Mixture consisting of 5 lb. copper sulphate, 5 lb. fresh lime, and 50 gallons of water. The applications of the fungicides were made at a cost of about 10/6 per acre, with a net profit in the return of about £8/10 over the unsprayed plats.

Beans.

Experiments consisting of distance and variety tests. Drilling beans in rows 2 ft. apart gave the larger yield and an earlier crop than drilling in rows 3 ft. apart. In the variety test the Brown or Swedish bean stood first in yield, Dewey Navy second, and California Wonder third. The Dewey Navy is an early variety, and sells well. The Great Northern and Aristook are a little earlier, but are not considered equal to the Dewey Navy on account of being dwarf and light-yielding varieties.

Tomatoes.

The reports upon tomatoes from the South Dakota Station are instructive, particularly in view of the acknowledged fact that new strains of tomatoes seem to be desirable in Australia, or new method of treatment. The authorities from this station report that plants started in cold frames compared favorably in yield and earliness with those started in the greenhouse. When grown in a cold frame the seed were planted in bottomless tin cans or like holders which made transplanting to the field easy. This method is practical only for small areas. Among the heaviest yielding tomatoes for the first half of August in 1899 were Earliest of All Salzer, Earliest of All, Vaughan Earliest of All, and Early Leader. For the whole season Early Leader, Early Bird, Bright and Early, and Early Ruby were the heaviest yielders. Some experiments are under way at the station in crossing tomatoes to secure a smooth variety which will ripen its main crop in July and August. Red Cherry has been used as a mother, and crossed with Early Ruby, Bond Early, Minnesota, and Ponderosa. At the New Hampshire Station two methods of starting tomato plants have been tested. In one the plants were transplanted into small boxes so arranged that the bottom could be easily removed and the dirt allowed to slip out, and in the other they were transplanted into 4-in. pots. The percentage of loss from transplanting was very much less when the pots were used. The pots seemed to induce early maturity and early fruitfulness. The pot system takes more time and occupies more space, but it surely pays. The kind of soil in which the tomatoes were planted seemed to have an effect on the amount of rot produced. Where the soil was inclined to dry out the rot was much more prevalent, while on a loamy moist soil there was very little rot. Where the soil was the most clayey the rot was worst.

The Ontario experiment report states that such varieties as Earliest of All, Express, Plentiful, and Atlantic Prize were practically free from rot, while some other varieties, such as Livingstone, Favorite, Ignotum, Paragon, and Volunteer lost from one-third to nearly one-half of the crop from this cause. It is thought that this loss might have been prevented had the plants been sprayed with Bordeaux Mixture, but this was not done in order to ascertain the susceptibility of the different varieties to the disease.

Varieties standing at the head of the list for total yield of sound, ripe fruit were Earliest of All, Plentiful, Express, Atlantic, Prize, and Ignotum. The first three yielded about 11 lb. of ripe fruit per plant.

DIOSMA.

The name "divine perfume" is given to this favorite shrub on account of the sweet smell of the leaves, but the flowers give out a most unpleasant odor. The Hawthorn and Pear blossoms have a similar smell, reminding one of herring-brine, and it probably arises from the presence of the same substance, Trimethylamine. If the odor is given out to attract insects it shows that in this instance they and ourselves have different tastes! The bad odor of Stapelia and of Arum maculatum seems intended to attract the flies that lay their eggs on carrion.

CULTIVATION OF THE APPLE.

An exceedingly interesting and practical paper upon this important subject was read before the Australasian Science Congress held last year at Hobart by Mr. S. Shoobridge, the well-known orchardist of Glenorchy. The contents of the paper, published in the proceedings of the Congress by the Hobart "Mercury," are the deliberations of many years' experience, and should prove of exceptional interest to orchardists throughout Australia, particularly in the hilly districts where the climatic and soil conditions are similar to those in Tasmania.

The first consideration in fruit-growing, the writer says, is the

SELECTION OF THE SOIL AND SITUATION.

In Tasmania almost any soil is suitable for this purpose, from the lightest soil to the heaviest clay. Where possible, an eastern aspect is preferable to any other, for many reasons. First, because of the morning sun; and, second, because it is generally sheltered from the strong north and north-westerly winds. In all cases where the soil is not naturally drained, it should be done artificially, either with tiles or brush or stone, to a depth of not less than 3 ft. This is most important, as the trees will not thrive where the water lays for more than a few hours. I should like to lay special stress upon this matter, as it is not given nearly enough consideration by intending planters. Varieties of fruit, such as the French Crab, Sturmer, and Stone Pippin require more moisture than most kinds, and this should be taken into consideration when selecting soil and situation. Again, the Cleopatra, King Pippin, Cox's Orange Pippin, and others of the earlier varieties, can manage with a lighter rainfall, as well as soil, to come to perfection.

SELECTION OF VARIETIES.

These, to the ordinary grower, should be, I think, limited to about eight different kinds, viz.—Dessert: Ribston Pippin, Cleopatra, Cox's Orange Pippin, Aromatic Pearmain, Scarlet Pearmain, Nonpareil, and King of the Pippins. For Culinary Purposes: French Crab, Sturmer Pippin. There are several hundred other varieties, many of which do well in Tasmania. At the same time, from a practical and also commercial standpoint, the varieties above-mentioned give the best results in Tasmania, owing to our comparatively low rainfall and strong westerly winds in the summer and autumn months. In selecting varieties careful consideration should be given that the stocks are of the best blight-proof sorts, such as the Northern Spy or Winter Majetin. In some districts, however, the blight-proof stocks do not do as well as the ordinary ones, partly, I think, owing to the artificial richess of the soil the stock is raised in as compared with the soil of its permanent location. Again, it should always be borne in mind that trees grafted on blight-proof stocks do not come into bearing as soon as ordinary ones, yet, at the same time, they last longer, and are more satisfactory to the grower. In selecting new and early kinds in other parts of the globe, many people in Tasmania are much disappointed with the results. The chief reason for this is, I think, they overlook the fact that climate is a far-reaching factor in successful fruit culture.

PREPARATION OF LAND AND PLANTING.

The land should be ploughed in the late summer, and again in the autumn, scarified, and, if rough, a disc harrow should be used to break the clods, so as to bring the land into thoroughly good order. Too much attention cannot be given to this, as the benefit derived from good cultivation cannot be overestimated in the latter growth of the trees. Before planting in poor land, it is as well to put some compost round the roots, as it gives the trees a better chance of free growth from the beginning, which is very desirable. The roots of the young trees should be cut with a sharp knife all round, as it throws vigor into them. From six to eight inches is quite deep enough, and the roots should be carefully spread out after any tap roots which may be present have been removed, as they only strengthen one particular part of the tree, which is most undesirable, the chief aim being to feed the tree in every direction. Planting should be done not later than June or July, and the soil placed lightly round the roots, and then pressed firmly about the collar of the tree; by this means enabling it to benefit by the later winter rains and make a good start in the following spring, as the roots begin to throw out fibres long before the stem shows any sign of growth. The trees should be placed about eighteen feet apart, and this leaves ample room for cultivation. It is good practice to plant the different varieties together, thus saving labor in picking.

(To be Continued.)

BURSARIA SPINOSA.

If the leaves of this native shrub be left in water for a day the water has peculiar optical properties. When looked through it is of a tea brown, when looked at it is of a beautiful blue. Upon analysis the Professor of Chemistry in the Adelaide University found that the leaves contained Aesculin, the same substance which gives the bark of the Horse-chestnut similar properties. Is it only a coincidence that the slopes of the Mount Gambier Blue Lake are covered with this shrub? The blue color has hitherto not been accounted for.

TRANSPLANTING. . . .

By H. E. VAN DEMAN.

ONE of our correspondents has lately raised a question about the theory of shortening roots and tops at transplanting. We do a great many things the true philosophy of which we could not give and this may be one of them. No doubt we all have ideas on the subject and perhaps correct ones in many respects. It may be that something more of importance in our work can be brought out by discussion of this subject. I make no pretensions to a complete understanding of it, but I think we should have reasons for what we do and be able to give them.

Now a theory is worth nothing that is not borne out by facts. Indeed, a true theory is generally a deduction drawn from a series of facts. In any case, the theory and the facts must correspond.

We will, perhaps, all agree that a tree or plant growing where the seed was planted does not need its roots cut or changed in any way to enable it to attain its best development, but we will doubtless disagree about the matter of cutting the branches in different degrees and after different styles, which we call pruning, and some would not cut them at all. The evident purpose of the tree or plant is to make wood and to propagate or reproduce its species. When we bring these same things under culture we generally have different purposes in view than those which are strictly natural, such as the production of large fruit, or excessive development of flower, root, or leaf. Therefore we may need to divert or oppose nature in several directions or degrees.

In carrying out our ideas we are almost sure to need to transplant the greater part of those things which we cultivate, and to be able to do this in the quickest and most successful way is one of the very desirable things to know. Different trees and plants will require different treatment, but there are certain principles that are quite generally applicable.

When a tree or plant of any kind is taken up a part of its roots are almost surely cut or torn away. They generally extend much further than we imagine. The feeding roots are mostly on the extremities, and are called root hairs and spongioles. They are so delicate that they can rarely be removed from the soil and replanted in a new place with safety. The absorbing of all the water used by the entire tree or plant, to the tip of the furthest branch, is done by these little organs. If they are not present or are seriously injured growth cannot proceed until they are restored. Nature alone can restore them, and this ability must lie within the plant. If it does not, then death is sure to follow.

Most trees and herbs, too, have the faculty of storing plant food in their roots, and in many cases in their tops as well, for their future use. This plant food we often use as food for ourselves, as in the case of turnips, beets, potatoes, onions, cabbages, and many other vegetables. It is done to some extent by nature in the twigs and buds of trees and shrubs. Animals find good food in many such things, and birds sometimes feed upon buds in winter time. The storehouses of nature are drawn upon for the growth of flowers and seeds very largely, and also for general growth. This can be seen by setting cuttings of various kinds of trees in moist soil, and then observing their behaviour. I once set a lot of cuttings of hickory, oak, maple, and many others that I knew would not strike root, just to see what they would do. The kinds having large buds were the first to start, and some of them made shoots and leaves of considerable size, but all died for lack of roots to sustain them. The growth was the result of the food and vital force stored in the buds and wood. A cutting that will grow is one that has the peculiar ability to strike roots easily, and thus get food and water from the soil to maintain the growth begun by the parts above ground.

Young trees or plants of any kind have a considerable degree of these vital elements within their structures, and when they are transplanted there must be the proper conditions for their development or success can not follow. These requirements are variable, of course, but warmth, moisture, aerated soil, and available plant food are essential in all cases, in some degree. They have the ability to force growth of both root and branches if given anything like proper opportunity. As a large part of the vital force lies in those parts of young plants nearest the collar, as all who have closely observed them have doubtless noticed, it is plain that therein also lie our best opportunities for causing their future development. This is true, whether it be young annual plants grown from seeds, such as those of the tomato, cabbage, beet, celery, petunia, pansy, etc., or those of the strawberry, raspberry, grape, apple, peach, and all others of a woody nature. From these parts we can get the most vigorous growth while the plants are young, but not when they are old, except in rare cases.

From the above statement of facts it is easy to understand why we have found it to be true to our practice that it is beneficial to cut away the more delicate and vigorous parts of both root and top when we transplant. If we cut them back to where the vital forces are greatest we will get the quickest and most vigorous response to our efforts to induce new growth. Nature will immediately begin the process of the re-establishment of the natural functions of the plant by sending out new rootlets and new shoots and leaves, provided the proper conditions of temperature and moisture exist. But, if these conditions are not present, then the results will be proportionately unfavourable. For instance, if the ends of the roots, where the growth should normally begin, are so deep in the ground that the soil is not warm enough to start growth quickly, then the plants may fail either partially or entirely. We occasionally see trees that have been planted so deeply that they dwindle and sometimes die. In some cases the roots die, partially from lack of sufficient air in the soil, as where earth is filled in deeply about large trees.

When all the conditions of soil, temperature, climate, and plant food are favourable, it is better to cut back both top and root before planting, especially if the trees or plants are small. This is the basis of the Stringfellow method of planting, as I understand it. I have tested this plan repeatedly with trees as well as with tender plants, during the last 40 years. It works very well under proper conditions, but not unless they are just right. In my opinion, that is why it is more applicable in the southern States, where the climate is milder, than in the north, where it is more severe and changeable and the soil more compact.

In cutting back the tops the main benefit is from lessening evaporation. It is, perhaps, generally well understood that the leaves and other parts of a plant that are above ground evaporate great quantities of water in the growing season, and an appreciable but much smaller portion in the dormant season. This water must be supplied by the roots from that stored in the earth. Until the roots are well established we should endeavour to make this draft as light as possible by lessening the evaporating surface.

These statements and explanations comprise the elementary principles of transplanting, as I understand them, and if they are lucid enough to transmit a knowledge of them to others, who, like myself, are seeking knowledge, then have my efforts been sufficiently rewarded.—*California Fruitgrower.*

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MONDAY, SEPTEMBER 1, 1902.

Editorial.

We must repeat our acknowledgments of indebtedness to our fast-increasing circle of friends, who are constantly assisting the Staff of "The Australian Gardener" to make it a success. The flattering Press notices of the publication that have appeared from time to time are exceedingly gratifying. The issue for September deals largely with Daffodils. We are making a specialty of this flower in this number because of the keen interest at present centred upon it, and we think that our readers will appreciate the practical character of the articles given.

In reference to the Photographic Competition we may mention that the time for entries will close at the end of this month.

SHOWS IN SEPTEMBER.

NEW SOUTH WALES.

Sept. 3rd and 4th—Junee P. A. & J. Assoc.—G. W. Scrivener.

Sept. 3rd and 4th—Murrumburrah P. A. and J. Assoc.—J. A. Foley.

Sept. 9th and 10th—Young P. & A. Assoc.—C. H. Ellerman.

Sept. 10th and 11th Albury & Border P. A. & H. Assoc.—W. J. Johnson.

Sept. 11th and 12th Yass P. & A. Soc.—W, Thomson.

Sept. 17th—Berrigan A. & H. Soc.—G. Hamilton.

Sept. 17th and 18th—Germanton P. A. & H. Soc.—C. T. S. Wilson.

Sept. 18th and 19th—Burrowa P. A. & H. Assoc.—John L. Clifton.

Sept. 23rd and 24th—Temora A. & P. Soc.—W H. Tubman.

VICTORIA.

Sept. 2nd to 6th—Royal Agric. Soc. of Victoria—T. Patterson.

Sept. 4th 5th and 6th—Royal Hortic. Soc. of Victoria Daffodil Show, Town Hall, Melbourne—W. R. Church.

Sept. 10th and 11th—Geelong and Western District Soc.—H. D'Helin.

Sept. 11th—Casterton P. & A. Soc.—H. N. Jacobs.

Sept. 12th –Horsham and Wimmera District A. & P. Soc.—L. Smith.

Sept. 16th and 17th—Stawell and Wimmera District A. & P. Soc.—J. A. Larkan.

Sept. 17th—Lancefield Farm and Garden Soc.—

Sept. 19th—Rupanyup and Dunmunkle District A. & P. Soc.—I. I. Gibson.

Sept. 23rd—Minyip and District A. & P. Soc.—J. D. Heckle.

Sept. 23rd—Devenish A. & P. Assoc.— P. L. McCallum.

Sept. 24th—Ararat A. P. & H. Soc.—T. Gibson.

Sept. 24th—Echuca A. & P. Soc.—A. F. D. White.

Sept. 24th—Elmore District A. & P. Soc.— R. Warren.

Sept. 30th—Dookie A. & P. Soc.

SOUTH AUSTRALIA.

Sept. 3rd—North Western Agric. Soc.—Crystal Brook—Mark Weston.

Sept. 11th 12th and 13th—Royal Agric. and Hortic. Soc. of South Australia.—Jno. Creswell.

Sept. 17th—Gawler Agric. Soc.—A. G. Wells.

Sept. 17th—Snowtown A. H. & F. Soc.—C. Green.

Sept. 23rd and 24th—Narracoorte P. & A. Soc.—Jas. McGilchrist.

Sept. 24th—Burra P. & A. Soc.—John McLaren

Sept. 26th—Balaklava and Dalkey Agric. Soc.—David Virgo.

SOCIETY MEETING.

Sept. 6th—South Australian Gardeners' Sy., Marlborough Chambers, Waymouth Street, Adelaide.—J. P. Knight.

BURSTING BUDS.

ALTHOUGH in the summer months the activity of vegetative life is marvellous enough, yet its manifestations are far less striking than in the first week or two of the spring, when the leafage under the genial influences of the sun and shower, is rapidly decking the erstwhile skeleton trees with fresh and verdant growth. We take little note of the further development and ripening when once the leaf has shaken itself and expanded more or less into its normal shape, it is merely a matter of addition, but at the outset there is a suddenness about the developement which strikes the eye forcibly. One day the tree is bare and its buds black, the next a flush of delicate greenery is perceptible and on closer investigation every point is seen to have broken bounds, and the tiny tiplets of the coming foliage are just in evidence. This stage reached, expansion goes on by leaps and bounds, the glistening buds shake out their leaves almost as we look at them, and within the compass of a single week the tree is clothed with verdure, which, as yet unsullied by dust, unworn by breezy friction and unbitten by predatory vermin, has a freshness and charm which the more redundant foliage of summer days can never boast of. Nature, too, demonstrates in every bud a most marvellous capacity for packing; take one of these buds just opened and examine it. The whole bunch of leaves is complete as it emerges, and although they have been built up by the busy cells within the hard resistant shell which is now discarded, there is not a crease in the wrong place, nor a single vein of all the myriads distorted. Mark, too, as the seperate segments expand how the stalks lengthen, and each radiating leaflet assumes precisely the right distance to prevent subsequent overlapping, and consequent invasion of its neighbour's rights to the sunshine. Each cluster of leaves obeys the same law as regards its own little community, and, although there is an eventual struggle amongst the many communities, the whole tree assumes the best form possible to accommodate the majority. Every bud, too, has its individuality, even on the same tree, but taking different varieties, species, and genera, the study of the bursting buds is soon seen to be of inexhaustible interest. Take the various fruit trees, apples, pears, plums and so on, with their diverse leaf and flower buds, all determined by the subtle influence of past and forgotten sunbeams. The potent power of these has been hoarded up in those little hard knots at the tips of twigs all through the winter, and now break out here into barren leafage, and there into bunches of snowy or rosy blooms, each with a luscious embryo fruit in its bosom, and a store of honey as a sweet reward for the labour of love which the bee is ever ready to undertake and perfect.

Sir Henry Campbell-Bannerman is a great cultivator of Begonias.

Answers to Correspondence.

Daffodil, Melbourne (Vic.)—1. Are centipedes of use in Gardens? Are they injurious to human beings?

1. Centipedes live on insects and are therefore likely to be useful in the garden. 2. The larger sorts can inflict wounds as severe as those made by our small scorpion, but are not so dangerous as the black spider with red spots—latrodectes scelio.

1. There are a lot of brownish grubs here, potato grubs we call them, but they eat violets, cabbages, sweet peas, and plenty of other plants. Can you tell me how to get rid of them?

2. Unless the mature moths are bred from the caterpillars one cannot be sure of the species, as there are several kinds of which the grubs have the same form and habits nearly. The latter hide by day under the ground, and feed actively by night. The only safe remedy in small plots is handpicking by day and night and repeated attention. In large plots arsenical solutions of weak strength are recommended in America, but decoctions of tobacco or quassia chips may do as well, and are mostly harmless to the plants, which the first-named remedy is not. They are best applied for low plants by a hand spray syringe. Mere sprinking is usually ineffectual. The chief cause of the prevalence of these grubs is the absence of small birds, also magpies, which are very fond of them.

A. E. Simpson, Unley Park, S.A.—"I have understood that Mina Lobata does not seed in South Australia. Last year I gave some imported seed to an acquaintance, and he now brings me in seedpods containing fine plump seeds from plants sown by him. Is not this unusual? I enclose a few pods and seeds."

This is somewhat a rare occurence, though seed have been obtained from plant grown locally. The local seeds do not always germinate, but cases have been known when seeds are in good condition. "The Australian Gardener" will have the sample forwarded planted and the result watched with interest.

Lawrence wishes to know how to distinguish between the seeds of double and single stocks.

There is no sure guide about these seeds, and it is almost impossible to distinguish them. Young plants, however, can be distinguished. The double variety have a shorter and a more compact leaf than the single.

Lifting Daffodils.—It is only those varieties of Narcissi or Daffodils which produce offsets freely that may be lifted annually, and even with these it is not absolutely necessary. What is meant by the annual lifting and drying encouraging increase is that by this means it is possible so to separate and plant the offsets that the stock is increased more quickly. To dry bulbs of Narcissi in general after lifting them is not good practice, especially if they are kept some weeks out of the ground. They should be lifted, divided, and replanted at once. The fact that your small offsets dried up shows that drying and keeping small bulbs out of the ground is not advisable, nor is the separating and planting of very small offsets according to the variety to be recommended.

GARDENING OPERATIONS

FOR SEPTEMBER.

AN enthusiastic amateur gardener of happy position of being able to spend the ripened years and experience, who is in the evening of his life pottering about, albeit very actively, amongst the darlings of his age, the beautiful companionship of flowers, has sent us a flattering communication to say that this column of the paper alone is well worth the amount of the subscription. We quite believe him, and insert this acknowledgment by way of encouragement to our practical gardener who supplies the data for the articles. Amongst many other such letters we have been requested by several gardeners to name six or twelve varieties of particular plants mentioned. We have done this to some extent, indeed, as far as we can with safety. It is hardly wise policy to state absolutely that one variety is better than another, because the question of choice depends upon varying circumstances, such as position, soil, altitude, shelter, and so on. Flowers are like human beings, too, in many respects, constitution, for instance, may be robust or weakly and affected by environment. Then, again, a great deal depends upon taste. Some gardeners look upon some varieties of flowers as abortions, while others make favourites of them. Our choice is not likely to please everybody, for whom the paper is published, therefore we set down those varieties that we believe give the most general satisfaction without saying that they are positively the best.

Whatever may be said about choice and taste in flowers, everybody is agreed upon the matter of weeds. Not excepting even those people who allow them to overrun the spaces around their houses, which could otherwise be made beauty spots with very little care. Weeds are a nuisance, there is no doubt, but they all help to make the contrast of a well-kept garden more beautiful. The satisfaction of getting them out makes one forget the labour of it. Anyhow, now is the time that weeds grow apace and are apt to double the work of a garden if not kept well stirred out. A correspondent is bewailing the terrible affliction of having "soursops," or "soursobs" (oxalis), overrunning his garden. He has tried every kind of remedy suggested, but without permanent effect. We should say that if he had put all the time and energy used in applying specifics into turning the roots and bulbs up to the sun he would have found much greater satisfaction, in fact so far as we know the only real remedy in getting rid of the pest is to —turn them up. The advice regarding this particular pest is equally good for all others. The fingers of a pair of active hands with a garden trowel will clear a bed free of weeds quicker and better than anything else we know of.

Having got the young plants now well forward in the edgings, groups, and various designs in the open beds, a successional crop of half-hardy annuals should be sown on a slight hotbed, and towards the end of the month a few may be sown in the open.

RAISING FINE SEEDS.

For raising seedlings earthenware pans or shallow boxes must be used. Under no circumstances should tins or glazed ware be taken for the purpose, because it is highly essential that the sides of the vessel or receptacle should be porous for drainage and aeration. The receptacle should be half-filled with crocks, charcoal, or any good draining material. About an inch of prepared soil is sufficient, as too great a depth is liable to sour the substance for germination. Before sowing very choice small seeds it is a good plan after preparing the pot for the seed to water it well, and place in a hot sun for an hour or so. The object of this is to kill off the seeds of weeds and destroy the germs and eggs of insects. Attention to this little detail accounts for the success of many gardeners compared with others who are not too careful regarding the depredations of insect life which may not be seen on the surface of the soil or flying about in the air. The tender little plants die off, the secret dies with them, and very often the seedsman gets blamed for supplying indifferent seeds. Seedsmen, no doubt, in common with everybody else, have a good many sins to answer for, but in many cases the blame is shouldered on to the wrong cause. For seeds a general principle to work upon in making the soil is to take equal parts of sandy loam and leaf mould with a mixture of silver sand. Put the soil in firmly, and sift some fine soil on top, making it quite even. Give a good watering, and then sow the seeds, not too thick, so that when they germinate there will be breathing space. Small seeds do not require any covering. Drop them on to the top of the soil and press them evenly down with a piece of board or anything flat, so that they enter the damp soil. Larger varieties should be slightly covered with a sprinkle of sandy soil, and deeper covering according to the size of the seeds. If the soil is properly soaked before sowing no more watering is required until the seeds germinate. It is a good plan to place a pane or piece of glass over the pot after sowing, and when the plants begin to show themselves remove the glass gradually to harden off the plants. Care must be taken to shade the young plants during hot, sunny days, a piece of paper being all that is required for the purpose.

Plant out rooted cuttings that were struck in autumn, and while doing this it is not a good plan to push them into the ground as though they were so many dry sticks.

> Take them up tenderly,
> Fashioned so slenderly,

and place them in the carefully-prepared soil as though you intended them to grow by having their roots disturbed as little as possible. See, too, that they can stand up erect, not leaning over every which way, so that when they grow up they are like the leaning tower of Pisa. A little attention to these unconsidered details in the beginning of things makes all the difference to the aftergrowth of the plant.

A correspondent sends us a list of plants he thinks would be worth mentioning, and recommends putting out, although we are afraid the heat and dryness of the month may be against them. Nearly all of them are already mentioned and described in our last issue, but it may be of service to some who may not have seen the list:—Asters, Zinnias, Balsams, Coreopsis, Portulaca, Miniature and Double Sunflower, Petunia, Gaillardia, Gomphrena (Globe amaranth), Cornflower, Amaranthus, Tagetes or Marigold, Cosmos (Klondyke), Cockscomb, Hunnemannia, Jackobaea, Mesembryanthemum, Salpiglossis, Nicotiana, Zea, Rhodanthe, Convolvulus, Mina Lobata. The last-named he describes as a beautiful half-hardy annual climber, a very fast grower, admirably suited for covering unsightly fences and walls. The beautiful flowers produced in such abundance are composed of three shades. It is sometimes spoken of as the Tennyson flower, as it contains the colours of His Excellency.

ROSES.

Cultivation.— Keep your ground free from weeds, and the soil loose, to prevent evaporation. Avoid digging near the roots or the young fibres will be seriously injured, and your blooms suffer thereby. It is a good practice after watering or rain to lightly stir the ground with hoe or fork. Mulching round the plants in summer with old manure, grass sweepings, or other light litter, to keep the roots cool and moist, is beneficial to your plants, and saves labour in frequent waterings.

A very effective way of training vigorous growing Roses is to select strong shoots and tie them down at regular intervals to a ring of wire surrounding the plant at, say, 5 or 6 ft. from the stem. This gives an umbrella form, and causes the buds to break regularly from the base to the ends of the shoots. W. A. Richardson, Beauty of Glazenwood, Cloth of Gold, and Roses of similar habit, either as tall or low standards, treated in this manner are most effective for garden decoration. All the pruning required is to cut the flowering shoots back when the blooms are done. The main branches will last for several years, when they can be replaced by younger growth.

We are pleased to reproduce the foregoing suggestions from Mr. Arthur Scarfe whose observations in the subject of Rose cultivation have drawn favourable comment.

GRASSES may be taken up, divided, and replanted.

PAMPAS GRASS (Gynerium, from gyne, female, erion, wool; the stigmas being woolly) —Gynerium argenteum bears the the white plumes, and G. purpureum the purple. This ornamental grass is so well known that little need be said in the way of recommendation, and it is surprising that such a noble ornament is not more largely used in large grounds. It will grow almost anywhere under almost any conditions. It is surprising that many of the other beautiful grasses are not grown, if for no other reason than their utility and grace in the making of bouquets, table and hall decorations. When picked before they are full-ripe they last for any length of time, and always look ornamental in spite of the lack of art evidenced in their display.

ZEA, Maize or Indian Corn (from zao, to live).—Can be had in three or four varieties. The Gracillima variegata and the Japonica albo-vittata are really beautiful green and white variegated in foliage, and make charming additions to the surrounding shrubs and flowers.

PANICUM (from paniculum, a panicle; the form of flowering).—There is a goodly number of the varieties of this pretty grass, so useful for decorative purposes. Most of them come from the West Indies and North America. A good selection is Panicum altissimum, P. capillare, and P. plicatum. The lastnamed carries a fairly dense striped foliage. Another, P. variegatum, has white striped, pink tinted leaves, very elegant as a basket plant.

BOUVARDIA.—This perennial plant, named after Dr. Bouvard, a curator of the Botanic Gardens at Paris, is rarely seen amongst the choice plants of the cottage gardener, and not very often in the pretentious garden, and yet this is how one writer delivers himself of his charm regarding his particular flower. He says "they are not only chaste, beautiful, and diversified in colour, but rank amongst the most elegant border perennials we possess, blooming through the summer, almost until the middle of winter. As cut flowers for bouquet making (especially bridal bouquets), wreaths, show stands, and table decorations they are unrivalled. Some of them are beautifully scented, and all are much more hardy than generally pronounced, even by professional men. They suffer but slightly from frost during the coldest part of winter, and when once established are never killed in consequence, and for this reason are better planted in spring." Surely such testimony from a practical gardener is ample recommendation to see this somewhat neglected beauty come into greater favour. All that is required for their successful culture is a copious supply of top mulch and water during the hot, dry weather, and should be cut back each season in early spring. This month they can be propagated by cuttings and roots.

A few varieties mentioned as well worth cultivating are:—Alfred Neuner (white), Augustifolia (scarlet), Beauty of Brisbane (white), Beauty of New South Wales (creamy white, with base of petals and calyx flesh coloured), Cardinal (cerise with white eye), Dazzler (vermillion scarlet), Flavescens (single and double yellow), Humboldtii (three varieties, white), Leinantha splendens (scarlet), Maiden's blush (pink), Triomphe de Nancy (orange salmon), Van Lemoine (double scarlet).

DAHLIA (named after Dahl, a Swedish botanist).—These magnificent flowers are a perfect rage with many gardeners, and certainly there is much justification for excess of admiration, for their infinite variety in structure and colouring have a fascinating charm. In addition to the flowers themselves the foliage and growth of the plants entitle them to regard as noble specimens of garden beauties.

The propagation of the Dahlia has been, and still is to some extent, one of the current activities of the florist's business. Green plants obtained from early spring struck cuttings are, with a few exceptions, preferred for growing on for decorative and exhibition purposes. Many an amateur who cannot keep ground roots through the winter can strike his own cuttings and grow them on for planting out in due course. Few have knowledge of what a huge industry the supply of Dahlia cuttings alone has become, leaving out of the question the sale of rooted green plants. It is sometimes said there is a decline in the cultivation of the Dahlia, but the impression is an incorrect one. At the end of the summer, when the plants have died down, they are taken out of the plots, dried, and packed in dry sand, leaving only the stems visible. A reserve of roots is always desirable, because it sometimes happens that some roots which had borne exhibition flowers the previous year keep indifferently. Considerable losses occur from this, and then the roots in reserve are found very useful for furnishing cuttings. The small dry roots are placed thickly in boxes and half covered with soil, and in a proper temperature produce cuttings. A good, well-preserved ground root of a Dahlia will produce from 40 to 50 cuttings, but it is not well to take more than that, as the latter cuttings are certain to be weakly. For certain sorts of show Dahlias there is always a large demand, and, judging from this, the most popular sorts are Mrs. Gladstone, Colonist, John Walker, Maud Fellowes, Glowworm, and R. T. Rawlings. The most popular fancy varieties are Mrs. Saunders, Fanny Sturt, Duchess of Albany, Rebecca Peacock, and Mrs. John Downie, the latter one of the finest fancy Dahlias ever raised, being perfect in outline and symmetry. The cactus varieties have hit the popular taste in a forcible manner. Many of them are extremely beautiful, but many growers on the levels are discarding them. They are essentially suited to the climatic conditions of the hills.

FREESIA REFRACTA.—It is not very long since these bulbs came into popularity, and their glory for the season is now on the wane, yet a word or two regarding them may not be considered unseasonable. The Freesia belongs to the Iris family, and is a great favourite because it flowers early, is pretty, and sweet-scented The appropriate second name is given to it because of the "bent back" manner in which the flowers are set on the stem. If these be examined it will be seen that the lowest petal projects and is marked with a yellow honey-guide. The top flower, however, is symmetrical, and as there is no alighting ledge there is no honey-guide. Most side flowers have such a ledge, but the Hollyhock is without it, and as far as the writer's observations go, it is not visited by large flying insects.

DELPHINIUMS.

Delphiniums, or Larkspurs, are members of the Ranunculus order. The annuals are divided into the Ranunculus flowered, Hyacinth flowered, Stock flowered, and Branching stemmed.

"Ajacis," with blue, red or white flowers, derives its name from markings on the petals like AI.

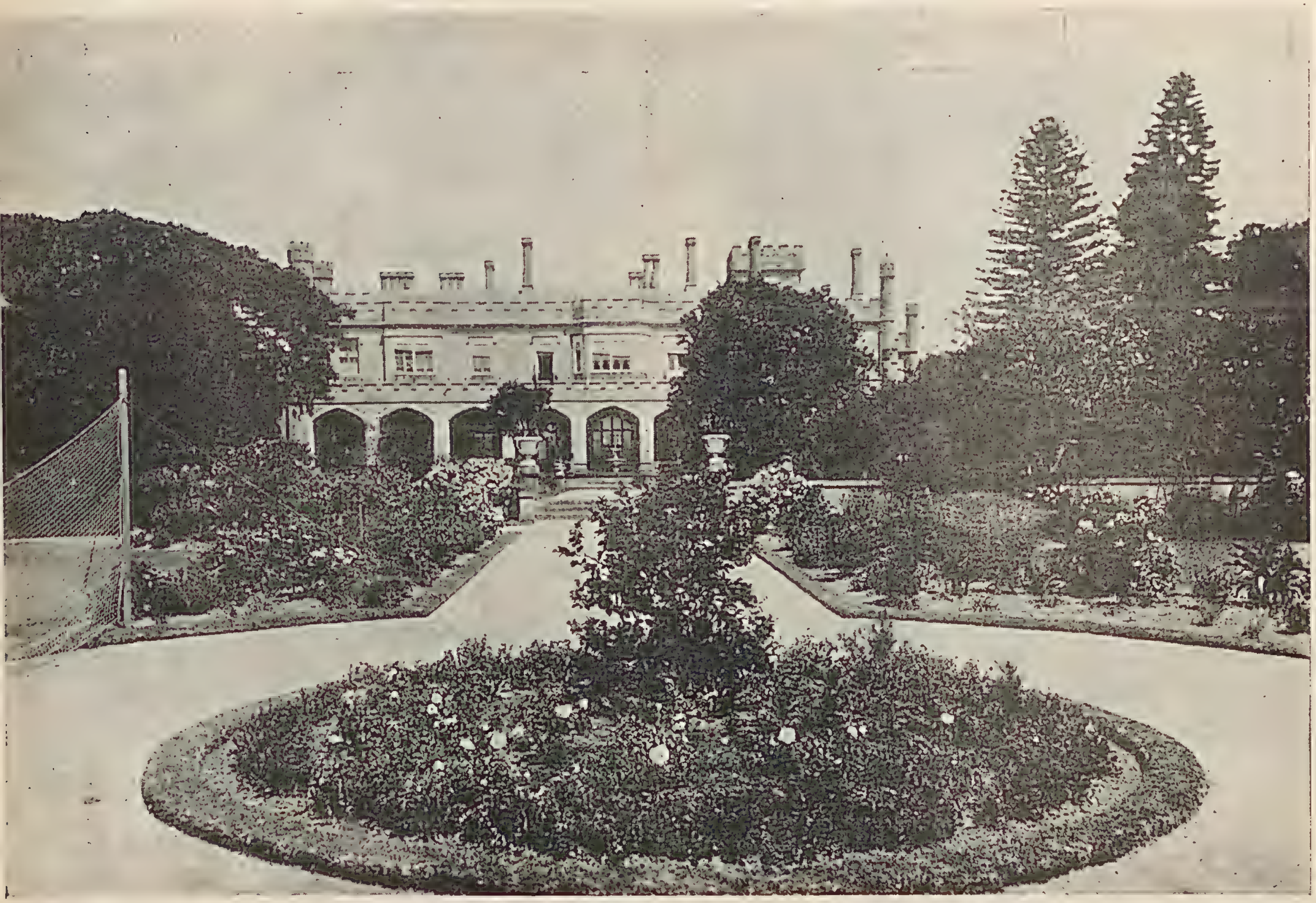
The perennial varieties are most in favour. Cardinale (one of the Bee-larkspurs) has scarlet flowers with yellow centre. Nudicaule auranliacum, orange with yellow centre. Zalil, yellow. Brunonianum, purplish blue, musk-scented. Grandiflorum, Cashinivianum, and others, of various shades of blue.

The colour of the Larkspur is so permanent that it has been retained in specimens taken from tombs in Egypt 3,000 years old.

Perennial Larkspur—Delphinium Hybridus (Amateur Gardening).

These tall and really superb hardy herbaceous plants are always favourite border flowers, and they have been so immensely improved of late years, that many of the plants raised from a packet of seed of a good strain are almost equal to the best named varieties. Besides making a grand display in beds or borders, the long spikes of flowers are exceedingly useful for cutting purposes to fill large vases in rooms. Delphiniums, too, are not at all particular to soil or situation which renders their culture easy, and plants raised from seed are usually more vigorous than those propagated by division of the root. To obtain good large plants, the seed may be sown in pans of light sandy soil, such as equal parts loam, or even garden soil, leaf-mould, and sand. The seed should not be covered too deeply and ought to be well watered, as soon as sown, with a fine rose watering pot. Of course, at this early stage the pans or boxes in which the seed is sown must be placed in a pit or frame till the seed germinates, and even till the young plants become a fair size. Delphinium seed is often very slow to germinate, and it has been sometimes thrown away under the impression that it will not grow, when it is in reality a question of time. When the seedlings are large enough to handle, they should be transplanted about two inches apart each way in shallow boxes. For this the soil need not be so light and sandy as that advised for seed sowing. Three parts loam or garden soil to one of leaf-mould and half a part sand would be more suitable. The young plants ought never to suffer for want of water at the root, and when good sized plants have been produced they should be planted out in good soil in the open, eight or ten inches apart, to remain till they can be placed in their permanent quarters in the bed or borders. It may be as well to mention that seedling Delphiniums do not flower the first season, so that the aim should be to grow them as strong as possible that they will flower well the following summer. Autumn is the best time to transfer the plants to the beds or borders intended for their reception. As before mentioned Delphiniums are not particular as to soil or situation, but the plants attain the greatest perfection in well-manured and deeply-dug or trenched soil in the open. In dry weather when the plants are growing vigorously an occasional good watering will keep the plants in the best condition, and prevent the flowers dropping so quickly as is then sometimes the case. It is scarcely necessary to add that weeds must be kept down by the frequent use of the hoe in dry weather, and by hand-weeding when wet. As some of the seedlings will turn out much better than others, the plants should be gone over when in flower the best selected and marked for propagation, and the inferior ones thrown away. It is a good plan to sow a packet of seeds annually, keeping the best varieties only. An important point is always to obtain seed from a well-known and reliable firm, or much disappointment may be experienced at the flowering period.

GOVERNMENT HOUSE, SYDNEY.



THOSE who are familiar with this view of Sydney Government House will immediately recognise the fact that our illustration does not represent the garden as it now is. The picture, however, being taken some years ago, gives a pretty landscape view, showing some of the trees of historical interest which have since been removed, and for this reason is acceptable, as well as being artistic. The distance covering the foreground admits of only the lower terrace being shown, while the flower borders and lawns near the House are hidden from view. There is also a flower garden on the left side not shown as approached from Macquarie-street.

The pleasure gardens of the estate consist of about four acres, the inner domain, or park, belonging to Government House being under forty acres in extent. The property contains many fine trees, some indigenous, and several of considerable age.

The Government House dates back into the thirties, with the original garden of the same age. But the whole estate was remodelled by Mr. Charles Moore during the past half century, while Mr. J. H. Maiden has made a number of alterations, consequent on additions to the House which have been completed during the last few years.

In addition to the landscape gardening there are two hot houses, and the usual appurtenances of a gentleman's garden. Partly owing to the very genial climate, and also to the skill of the head gardener, Mr. Helps, who takes a keen interest in the garden, an agreeable variety of flowers is maintained all the year round.

Approaching the House by the walk as shown in the picture attention is arrested by the circular flower plot with its dense edging and Souvenir de Malmaison Roses in bloom, set off with a fine Camellia tree in the centre. Walking round this to the left and up the path to the steps, flanked on both sides by a dwarf stone wall, the visitor's eye catches a good effect of mixed herbaceous borders on both sides. The large umbrageous tree on the left is a Ficus Macrophylla (Moreton Bay Fig), a very fine specimen, only partly shown. Ascending the steps and proceeding to the lawns and flower borders near the House, not shown in the picture, and looking to the right is seen a tree, hiding part of the picture of the House. This is a fine specimen of Magnolia Grandiflora (named after Professor Magnol), which was planted by Lady Young in 1861. This tree is now removed. Still looking to the right, two finely grown trees (Araucaria exelsa, from Araucanos, the name of the people in whose district Araucaria imbricata grows in Chili; natural order, Coniferæ) sixty years old stand up prominently as a background to the landscape. Immediately in front of them, showing dense foliage in the picture, are specimens of Erythrina insignis—scarlet (Coral tree, from erythros, red, the colour of the flowers; natural order, Leguminosæ) and Cryptomeria japonica—Japan Cedar (from kriptos, hidden, and meris, part; the structure of all the parts of the flower being hidden, or not easily perceived; natural order, Coniferæ). Also a Bauhinia purpurea, purple—mountain ebony (named after the brothers John and Caspar Bauhin, botanists of the sixteenth century; natural order, Leguminosæ), and other trees of interest. Passing along to the immediate front of the House in the picture, a tree is shown on the left of the footpath. This is one of a pair which originally stood (now removed) on each side of the stone steps. They are specimens of Meryta macrophylla, and belong to the natural order Araliaceæ, but the derivation of the name is unknown. It is suggested that it comes from meruo, to wind or roll up, but just why it is so suggested does not appear from the tree itself. They are natives of the Pacific Islands.

Daffodils.

Group of Daffodils.

Group of Narcissus Tazetta.

FEW flowers rival the Daffodil in popularity, and few are more frequently mentioned in English literature. That they were known and appreciated centuries ago is evident from the lines in "A Winter's Tale," Act IV., Scene 3:—

Daffodils
That come before the swallow dares; and take
The winds of March with beauty.

And, according to John Keats, they are responsible for the old legend of Narcissus and Echo:—

What first inspired a bard of old to sing
Narcissus pining o'er the untainted spring?
In some delicious ramble he had found
A little space with boughs all woven round,
And in the midst of all a clearer pool
Than e'er reflected in its pleasant cool
The blue sky, here and there serenely peeping
Through tendril wreaths fantastically creeping.
And on the bank a lonely flower he spied,
A meek and forlorn flower, with nought of pride,
Drooping its beauty o'er the watery clearness
To woo its own sad image into nearness.

Gay draws a moral lesson from the flower:—

Let fair Narcissus warn each female breast
That beauty's but a transient good at best.

But Wordsworth more cheerily sang:—

I wandered lonely as a cloud
That floats on high o'er vale and hills,
When all at once I saw a crowd,
A host of golden Daffodils,
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze.

Alas! where is such a sight to be found in these southern States? Residents in the hills around Adelaide, gardeners of Macedon, the Blue Mountains, and all the cooler districts of these States might have a similar experience to the poet's if they would take the trouble to utilise their advantages.

That the Daffodil will grow and thrive even in our climate is evident from the numbers of these flowers to be found in our streets late in August, or early in September. The season this year has been unfavourable to their early development.

Many people are perplexed as to the difference between a Narcissus and a Daffodil. It consists chiefly in the number of flowers borne on a stem. Narcissus is the family name, Daffodil the title given to a section of the genus in very early times. For gardening purposes, Narcissus is the name by which those bulbs are known which have many flowers on one stem, like the Polyanthus. Daffodil refers to those bulbs which usually bear but one flower on each stem. In this State the bunch-headed Narcissus bloom before the Daffodil. Of them the best known are Paper-white, Dubius, Paniz-zianus (a small but beautiful flower), Grand Soleil d'Or, Maximus, and Double Roman. They succeed in any ordinary garden soil, and once planted take care of themselves. The most desirable are those in which the perianth segments overlap each other, as in Grand Soleil d'Or. A common but less valuable type has the segments divided and the petals pointed, while they are limp and flabby in texture.

Daffodils are divided into three sections, according to the length of the corona, or "trumpet," as it is called. Division A has the segments of the perianth and the trumpet of equal, or nearly equal, length

Division B has the perianth segments half or three-fourths as long as the crown, while C has a crown so small that in "Sequin" it is like a ring on the perianth.

Division A contains some splendid flowers, many of them so expensive that most of us will have to do without the sight of "Monarch," "Lord Roberts," "Weardale Perfection," &c. But many of the cheap trumpet Daffodils are very beautiful. "Golden Spur," "Obvallaris," "Ard Righ," "Emperor," "Coronatus," "Mrs. H. J. Elwes," "Helen Falconer," "Lobularis," "Minor," and the dainty little "Minimus" can either be bought here or imported alive. "Mrs. Walter Ware," "Mrs. Thompson," "Madame de Graaff," "Empress," "Snowking," "Princeps," and "Bicolor" have been successfully imported and grown in this State, while "Cernuus," "William Goldring," and many more which are the better for shade can be cultivated satisfactorily around Adelaide with very slight protection.

Division B has considerably more orange and scarlet tones in the colouring of the flowers than is to be seen in the trumpets. "Gloria Mundi," "Sensation," Orphee," 'Flora Wilson," "Conspicuus," "Autocrat," "Cynosure," "Stella Superba," and many more are to be seen in good health and vigorous blooms; and even the delicate "Mary Anderson" has been successfully imported.

Division C is known as the Burbidgei and Poeticus section. Crimson edges, orange cups, scarlet crowns make all the members of this division desirable, and as they usually bloom later than other Daffodils a continuation of Wordsworth's pleasure-filling sight may be enjoyed even in our sunny climes.

This article would be incomplete if the "Bulbocodium" Daffodils were not mentioned. They are known by the homely name of "Hoop-Petticoat," and the cups or trumpets are very wide in proportion to the thread-like segments of the perianth. Of them all "Monophylla" is the most beautiful. It is wild in Algiers, covering the slopes of a hill there with its pure white blooms. Here it should either be grown in pots, or in a sunny position protected from cold winds. It is a difficult bulb to import alive, but it more than repays the extra trouble it requires.

Reflexed Daffodils are those of which the perianth is bent back like a Cyclamen. "Johnston's Queen of Spain" and "Cyclamineus" are the two representatives in the trumpet section; both rather difficult to keep alive, so far as my experience goes. "Triandrus albus" and its relatives "T. concolor," "T calathinus," "T. pulchellus" are the other forms of reflexed Daffodils. They are best grown in pots, and are difficult to import alive. Also they do not bear removal from one part of the State to another very well. These and the Hoop-Petticoat can be grown from seed, two or three years sufficing to obtain plants of blooming size. Other Daffodils require from eight to ten years to bloom from seed.

Double Daffodils are very charming. "Van Sion" is perhaps the most familiar; and it has a funny habit of coming green instead of golden yellow. Some say it should then be lifted and divided. "Butter and Eggs," "Codlins and Cream," "Orange Phoenix" are quite hardy in this climate, and the latter is a picture of beauty when in good bloom. "Cernuus Plenus" is very difficult to obtain. It must have shade, gritty soil, and no manure. It is double white, and rather expensive. "Queen Anne's Jonquil," "Rip Van Winkle," and "Scoticus Double" are all worth growing, while the double Poeticus, or "Gardenix Narcissus," is a deservedly popular and beautiful bloom.
—J. A. Stuckey.

Doubling in Cyclamen.—A double flower s by no means uncommon in Cyclamen, but a persistently double form is somewhat rare. Seed will not be readily produced, but it is not very likely that all the stamens have become petaloid. See that the flowers are fertilised by their own pollen and remove the plant from the influence of the single forms.

DAFFODILS AND HOW TO GROW THEM.

By W. Watson, of Kew, London.

"He that hath two cakes of bread, let him sell one of them for flowers of Narcissus; for bread is the food or the body, but Narcissus is the food of the soul." These are the words of Mahomet, and they have been taken to heart by Englishmen, to whom Daffodils, that "come before the swallow dares," and Narcissi, the poets' type of maiden purity and beauty, have become of considerable commercial importance, and also as beloved for their beauty and fragrance as the Rose itself.

For the Daffodil is essentially an English flower, in the same sense as cricket and football are English games. In Australia and New Zealand, in Canada and the United States, Daffodils rank with the most favoured of flowers, whereas in Continental countries, if we except Holland, they find scarcely any admirers. At a great exhibition held in Paris a year or two ago, a magnificent display of Daffodils made by several English specialists, was passed almost unnoticed.

Of all English plants—and the true Daffodil (N. Pseudo-narcissus) is wild in copses and moist woods throughout England—none have been in such constant favour as the Daffodil, which was a favourite garden flower with our ancestors, and especially as the flower for making garlands. The Rev. Canon Ellacombe, in his delightful book, "The Plantlore of Shakspeare," says it has been the favourite of all English poets from the time of Shakspeare, and even before, for Spenser spoke of "the green strowed round with Daffodowndillies."

The botanical name adopted by Linnæus for the whole family of Daffodils is of mythological origin. Narcissus was a beautiful youth who preferred gazing at his own reflection in the water to the charms of the nymph Echo, and as a punishment for his vanity he was changed by Nemesis, the goddess of justice and punishment, into a flower:

> "And looking for his corse they only found
> A rising stalk with yellow blossoms crowned."

There are about twenty species of Narcissus, and they are nearly all European, a few extending into Northern Africa, Persia, Cashmere, India, and even into China and Japan. Only about one-third of this number have any horticultural value, by far the majority of the popular sorts being hybrids or seedlings of garden origin. These are the progeny of N. Pseudo-narcissus, N. poeticus, N. Tazetta, N. Jonquilla, N. triandus and N. Bulbocodium. They all intercross freely, and out of them breeders have obtained the hosts of named varieties which add so much to the delight of the garden in spring.

Daffodils are first cousins to Snowdrops and Snowflakes, and this family relationship is evident in the bulbs, leaves, flowers to some extent, and fruits; the three genera are also alike in their habit of flowering early in the year. The character which distinguishes all Daffodils from other hardy flowers is the corona, or crown, formed by the prolongation of the tubular portion of the flower. Botanists have divided the species into groups, according to the length and shape of this corona, as follows:

Group I. Magnicoronati (large-crowned) or "Coffee-cups"—example, N. Pseudo-narcissus.

Group II. Mediocoroeati (medium-crowned) or "Tea-cups"—example, N. incomparabilis.

Group III. Parvicoronati (small-crowned) or "Saucers"—example N. poeticus.

Group II. is of hyrid origin, its parents being Groups I. and III.

Although Narcissus is the accepted botanical name for the whole of these plants, it is also used popularly in a more restrictive sense, and whilst we speak of them collectively as Daffodils, to be correct we should apply this term only to Group I., and that of Narcissus to Group III. When, however, we come to the hybrids between these two groups, we are met with the same difficulty as besets all attempts to set nature in order. There is still more restricted use to these two terms—Narcissus for the Poet's Narcissi simply, and Daffodil for the common Daffodowndilly of our copses and hedgerows.

There are at least five hundred distinct sorts recognised by experts and catalogued by the great dealers in them, among whom Messrs P. Barr & Sons, of Covent Garden, are the acknowledged leaders. This army of varieties has been raised by breeders chiefly within the last thirty years, for in 1870 there were only about fifty varieties grown. The enormous increase has been due first to an increase in the popularity of the Daffodils, brought about very largely by Mr. Peter Barr, the Daffodil king; Mr. F. W. Burbidge, M.A., the high-priest of the Daffodil fraternity; Mr. J. G. Baker, F.R.S., the botanical specialist; the Rev. G. H. Engleheart, the most successful breeder of Daffodils, and the Dutch nurseryman, Mr. de Graaf of Leiden.

The praises of Narcissi have been sung by the greatest of poets for ages, and the flowers have been loved by the gardeners of this country for at least three hundred years. Shakspeare, however, never saw any flowers such as "Emperor," "Glory of Leiden," "Ellen Willmott," "Maggie May," or "Will Scarlet." By the side of these his Daffadilly is as a stage-coach to a steam-engine. The development of flower-gardening in this country during the last fifty years has kept pace with man's taste and handiwork in other departments where he has found material he could mould to his will. What has been done is well told by Mr. Engleheart:

"The fearlessness of the Daffodil in our rough English spring—March is 'the roaring moon of Daffodils'—has made it pre-eminently an English flower, and the hands of Englishmen have fashioned it to its present beauty. Over 250 years ago Parkinson had anticipated Mr. Peter Barr in employing Pyrenean 'root-collectors' and described some hundred kinds of Daffodil.

The magic art of cross-fertilisation was then undreamt of, and the possibilities latent in Parkinson's store awaited the coming of Herbert, first Dean of Manchester. Herbert, who in one side of his versatile genius was something of a pre-Darwinian Darwin, published in 1843 the results of his many years' experiments at his Yorkshire rectory at Spofforth, and demonstrated that short crowned Narcissi are really hybrids between the trumpet Daffodils and the poet's Narcissus, N. poeticus. The first to avail themselves of this discovery were Mr. Leeds of Manchester, and Mr. Backhouse of Walsingham. By crossing and re-crossing they obtained the host of lovely forms now in common cultivation. These are being used by the breeders of to-day for the further evolution of size, form, and colour. The subsequent workers in the same field have all been Englishmen. Leeds sold his entire collection for a hundred guineas, but twenty times that amount would now be thought a small price. The glorious N. bicolor Horsefieldii raised by John Horsefield, the Lancashire weaver, was sold by auction for eighteen pence per bulb."

Compare with these prices that realised by Mr. Engleheart's seedling "Will Scarlet," three bulbs of which fetched a hundred guineas, whilst such sorts as "Weardale Perfection," "King Arthur," and "Hodsock Pride" cannot be bought under about £10 a bulb. "Maggie May" costs fifteen guineas, "Duke of Bedford" twelve guineas, "Big Ben" ten guineas, whilst no money could secure a bulb of "Ellen Willmott."

All Daffodils are not expensive; on the contrary, many of the most beautiful of the older sorts may be bought for a few shillings per hundred. To the inexperienced there is little or no difference between "Duke of Bedford" at twelve guineas and "Bicolor Grandis" at three halfpence; they are Daffodils and nothing more. But there are differences recognised by experts and indicated by the prices, and when the enthusiastic beginner has mastered the rudimentary stages and "got his eye in" he will be in a position to undertake the most fascinating, exciting, and, in some cases, the most profitable of all operations in all horticulture—namely, the creation of new flowers by crossing one sort with another.

"It is desirable to call the attention of the humblest cultivators, of every labourer and operative who has a plot of garden or a ledge to his window, to the infinite variety of Narcissi that may thus be raised, and most easily in plots at his window, if not too much exposed to sun and wind, offering him a source of harmless and interesting amusement, and perhaps a little profit and celebrity." Thus wrote the worthy Dean of Manchester fifty years ago, and Mr. Leeds, writing after considerable experience as a breeder of Narcissi, said: "There is no end to the varieties and elegant forms that may be obtained." Mr. Engleheart has stated that every known or discoverable variety of Narcissus will breed with every other, and that several varieties may be obtained from one and the same seed-pod, demonstrating that the possibilities in varied form and colour in seedling Narcissi are infinite.

How then are Daffodils bred? Let us see.

"Leedsii.—Maggie May."

White perianth. Pale citron frilled cups. A selection from Peter Barr's Catalogue.

To understand how the flowers are fertilised it is necessary to be acquainted with their several parts. When the flower expands the stamens or male organs bear clusters (anthers) of yellow dust-like pollen, and this, if placed upon the sticky apex of the stigma, operates in such a way as to cause the ovules to grow and form seeds. As soon as the pollen has done its work all the parts of the flower wither, except the ovary or fruit, which increases in size, finally turning yellow, when it will be found to contain small black seeds, which may be taken off and sown at once, or kept in a packet in a dry place until required for sowing.

If the pollen is taken from the same flower or one of the same variety, the seeds will produce plants like that which bore them; but if the pollen be taken from one variety, and placed upon the stigma of another variety, the result as a rule is a family of seedlings combining the characters of both parents.

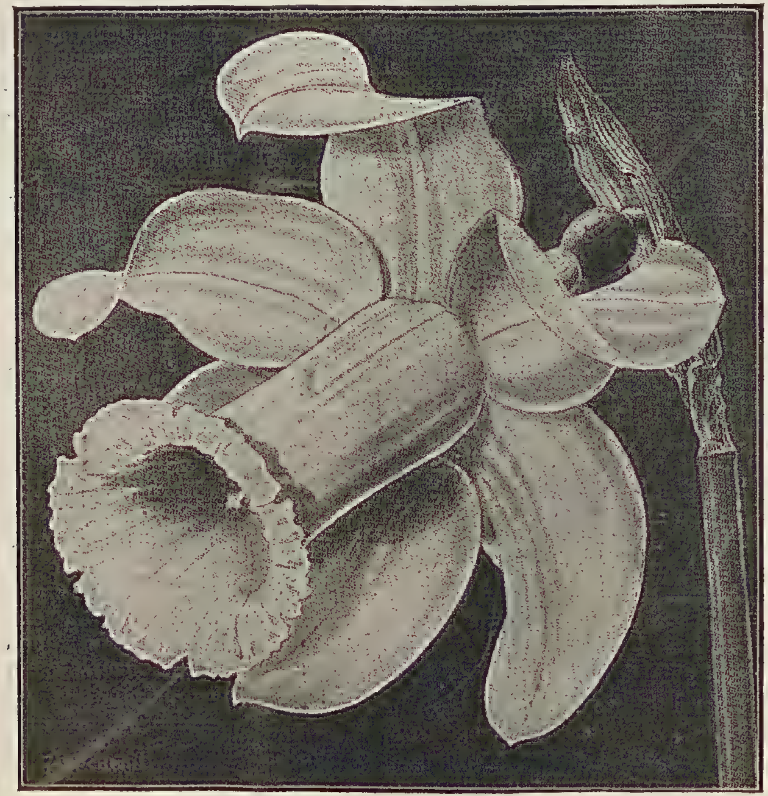
To ensure a cross it is necessary to remove the anthers from the flower intended to bear seed before the pollen is exposed, and this can be done by carefully opening the flower bud on one side and removing the anthers with a pair of tweezers. A piece of muslin may then be placed over the flower, or a handlight over the whole plant, to keep out insects, etc., until the stigma is in a receptive condition, which is easily ascertained by touching it gently, or the sticky substance can be seen when it is ready.

There is nothing very difficult or mysterious in this operation. The value of the results will depend upon the quality of the parents and the nature of the blend. "We can, to a large extent, mould the hybrid to our design, according to the elements we employ in the mixture. . . By selecting the most shapely, substantial, and robust forms to breed from we can, with considerable accuracy, secure a fine progeny." (Engleheart).

Seeds produce flowering bulbs in from four to six years, but if crosses are made every year, after the first long wait each spring will bring its set of unknowns. Imagine the wild delight of finding amongst these such glories as "Will Scarlet" or "Big Ben!"

The seeds may be sown as soon as ripe in pans or pots of ordinary soil, just burying them and placing them in a frame or under a handlight, giving them water if the soil gets dry. When two years old the seedlings may be transplanted into beds as though they were Onions. Of course they are quite hardy, and will not therefore suffer during severe frosts.

The cultivation of Daffodils generally presents no difficulties. All the sorts here named are easily kept from year to year. If grown in beds or borders they should be lifted every second year or so, and even when lifted every year to make room for summer flowers, they do not suffer if treated with proper care. At Kew they are perforce lifted annually, even before the leaves have withered; and to enable the bulbs to ripen they are laid by the heels in cinder ashes in a sunny place, where the leaves soon turn yellow and wither. The bulbs are then cleaned, sorted and stored in hampers in a cool shed until they can be replaced in the ground again in October. Bulbs grown in clumps in borders may remain in the soil till the leaves wither, when they should be lifted with a fork, the clusters broken into single bulbs, and then replanted again. The top of the bulb should be three inches below the surface of the soil.



"Peter Barr."

Sulphur white. The perianth a shade purer in whiteness than the trumpet. From "The Australian Agriculturist."

The sorts that do best in grass are "Countess of Annesley," "Golden Spur," "Poeticus," "Spurius," "Moschatus," "Tenby," and "Obvallaris." These all spread naturally, and, as a rule, take care of themselves. Many other sorts may be planted in grass, but as they will not all continue to flower year after year they require to be renewed. To produce the best effect the three groups should be kept separate; thus the Star or Saucer Narcissi should not be mixed with the Great Trumpets, nor the Poet's Narcissi with the Star Narcissi. In arranging make the breaks large and bold, scattering the bulbs over the ground broadcast with the hand, and dibbling into the ground where they fall. Avoid symmetrical lines or formal circles as far as possible, as these are never found in nature.

To plant in grass take an iron crowbar or a stout wooden dibbler (like a potato dibbler) with a strong tread; make the hole in the ground about six or seven inches deep, and half fill with a good mixture of prepared soil consisting of two-thirds loam and one-third old leaf soil; into this press the bulb, and cover up the hole with some compost; this will give the bulbs a fair start, and success is sure to follow. In planting under trees, avoid places where the drip from the branches is greatest, also where the main roots come close to the surface.

The budding Daffodil worshipper in the neighbourhood of London should pay a visit to the great Daffodil nursery of Messrs. P. Barr & Sons at Long Ditton, where, in April he will find one of the most magnificent flower displays to be seen any where round London. Here is a description of this nursery, written by one who saw it last year:

"As you catch the first glimpse of the grounds, that seem to stretch for miles into the distance, you almost gasp. You had not realised that there were so many Daffodils in the world and here they are, in one corner of suburban London, flowing like a stream of gold, down, down, down, to who knows where? Occasionally a great island of crimson, and flame-colour, and rose-pink, and creamy-white interrupts this stream. These islands are the early Tulips. There, under the shelter of a high bank, lies a square as of blue velvet; the Grape-Hyacinths are in full bloom. Then a stretch of cool green Tulip foliage; beyond, bed after bed of Polyanthus, glowing like jewels. And after that, the Daffodils. I am under orders not to go into dithyrambics, nor to quote Wordsworth. These are cruel orders. Perhaps the next best thing is to quote Mr. Barr, jun., the guide through the Daffodils.

"How many bulbs are there in the ground here?" you ask, wondering if figures can express the prose aspect of these waves and billows of innocent gold. "I could hardly tell," says Mr. Barr; "at all events, some millions. There are 20,000 bulbs in this bed!" And "this bed" is but a drop in the Daffodil stream! Turn your attention to the individual flower. You never saw such Daffodils. . . . These before you, in the 20,000 bed, are monsters for size, and marvels for loveliness of tint. "That is 'Emperor,'" Mr. Barr tells you, "and is one of the finest of the Trumpets.

We wander on to another little bed of scores of thousands. This time the splendid yellows are toned down, the gold of the trumpet is a little paler, the tints of the perianth are shaded from pale gold to silver. "This is a new Bicolor named 'Victoria,' and only came into the market in Jubilee year. Hence its name." There is a dainty beauty, "Madame de Graaf," a kind of dream-Daffodil, in shades of velvety gold and silver, a tiny, delicate cup of almost transparently clear yellow, called "Queen of Spain"; then, again, a splendid flower of various shades of gold, named "P. R. Barr" and score upon score of others, each lovelier than all the rest. It is no use trying to picture up in mere words the perfect form of the silvery white "Swan's Neck" Daffodil, or "Barri Conspicua," with its cup brimming over with burnished gold; the fragrance of "Odorus Rugulosus," three twinkling stars growing on one stalk. The number of names becomes confusing, and you clutch, with somewhat of relief, at the three pretty double Daffodils which the voice of the people (in prehistoric times, of course—for we would never have the genius of inventing names of such classic simplicity) dubbed respectively "Butter and Eggs," "Eggs and Bacon," and "Codlins and Cream."

"Are there still single bulbs which, for their cost, remind you of the times when fortunes were paid for a rare bulb?" "Not exactly. We have a Daffodil, 'Monarch,' a large golden-yellow trumpet, which we sell at £15 15*s*. a bulb. Who buys such? Why, enthusiasts. The cheapest Daffodil is 'Princeps,' a fine early Irish flower; it sells at £1 10*s*. the thousand."

The show of Daffodils it may be noted, begins when, early in February, two small "Trumpets" begin to blow, and goes on till, in the middle of May, the "Pheasant's Eye" twinkles upon the early summer flowers. It is a pageant of great beauty all the time, but most beautiful at the end of April, when more shades of yellow than our philosophy dreams of are sported by the Daffodils.—*Boys' Own Paper.*

Carnation Growing in Tasmania.

THE writer of the "Country Housewife's Garden," published over 300 years ago, writes thus of the Carnation:—"July flowers, commonly called Gilly flowers, because they flower in July, I may call them the king of flowers (except the rose). The best sorts of them are called Queen July Flowers—some of them are as big as roses. Their use is much in ornament and comforting the spirits by the sense of smelling."

The estimate of this old writer is generally accepted at the present day. The rose is still the Queen of flowers, but next to it we must place the Carnation. We do not seem to have gained much with regard to size of the flower, but to have gone back as regards fragrance.

The Carnation has one advantage over the rose, in that it will flourish in positions where the rose would make a complete failure. In smoky districts that would be death to the rose the carnation would be in its element. Carnations are usually divided into four classes, as follows, Selfs, Bizarres, Flakes, and Picotees. Selfs are of one colour only, without marks or shadings; Bizarres are those in which the white ground colour is striped with two colours, one being darker than the other; Flakes are those in which the ground colour of the petals is striped with only one colour, purple, scarlet, or rose. In the Picotee, the colour is distributed in curves round the edge, forming by a combination of the petals a circle more or less perfect. If the colour be dense, it is styled heavy edge, and if a light edge medium, and if a very fine edge of colour it is termed wire-edged. Its ground colour should be white or yellow, pure and without blemish In some instances the more delicate-edged Picotees appear to be of less robust character than Carnations generally, and it is probable that a considerable amount of breeding in and in to secure the fine beaded edge may have induced constitutional weakness. It may be fittingly described as the feminine of the more muscular Carnation. The Picotees are divided into three sections, red edged, purple edged, and rose edged. Although the Picotees are often classed separate from Carnations they both require the same treatment, and both may be raised from one pod of seed.

Cultivation.

The Carnation is one of the easiest cultivated of plants, and will lend itself to the various forms of garden ornamentation. It can be grown in the mixed borders, on single lines, or, better still, in beds by themselves. The first consideration is the preparation of the beds, which for several reasons should be undertaken some time beforehand in order that the ground may have time to settle before the plants are put in, as a firm root run is one of the first principles of successful Carnation culture. Time and a good soaking rain will bring this about more effectually than treading. Stiff or clay soils do not require compressing as lighter formations, but in loose soil plants will not thrive to any extent or for any length of time. Planting may commence in autumn, through the winter and early spring, but the best time is early autumn, and on no account should the plant be pot bound, but just started to grow in the pot, and transferred to its blooming quarters. Carnations are never satisfactory if once pot bound. A piece of ground in an open and sunny position, yet sheltered from strong winds should be chosen if possible. The ground should be deeply dug—a good double digging—that is two spits deep, if the ground is old garden soil, and a thick coat of well-rotted cow manure, well mixed with the soil. Do not fall into the error of making the ground too rich with manure. This would have a worse result than the other extreme of poverty. Extra nourishment can always be supplied later with the best results by means of artificial manure, or mulching and liquid manure in dry times.

Yellow Ground Perpetual.

Heavy soils will be greatly benefited by the addition of sand or grit, sea sand is excellent, as it contains a small percentage of salt. Burnt soil is also good Carnations make quick and strong growth in charred earth. If the soil be a very light one it will be specially benefited by a dressing of burned garden refuse. Carnations are also very fond of lime or old mortar, but it must not be overdone. Bonedust and superphosphate are the best fertilizers, dusted over the ground at the rate of 3 pounds per square rod. Soot is cheap and an excellent fertilizer.

The beds should be 4 feet wide, raised fully 6 inches higher than the path; these beds will hold three rows of plants 15 inches apart. One of the secrets of successful culture is firm planting, spreading the roots out neatly (that is if the plants are not in pots). Press the soil firmly down well around the plants. The roots should be well covered with soil, but at the same time do not bury the plants in a hole, rather let their foliage stand clear of the surrounding soil. If in damp ground let each plant stand on a slight mound and receive a good watering to settle the soil around it. If from pots, plant the same depth as the pot they were in. If in heavy soil some light material may with advantage be placed around before the heavy soil is filled in.

The after cultivation consists principally in keeping the ground free from weeds, giving water in dry times (though none will be required during winter), supporting the flower stems as they rise, thinning the buds more or less, and destroying earwigs and other pests.

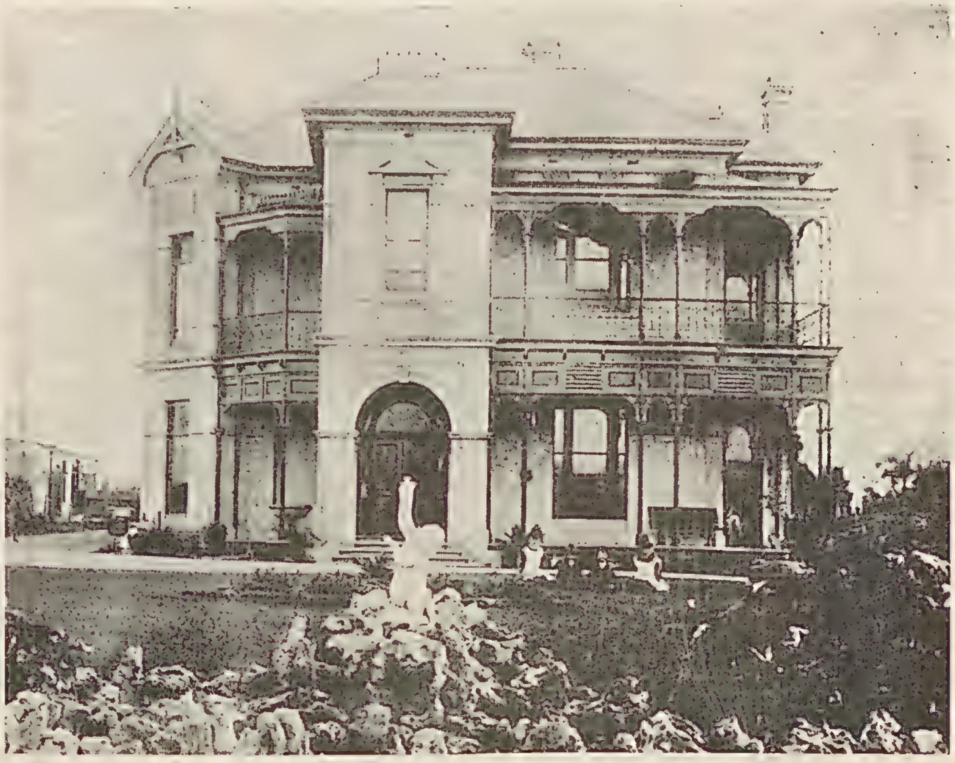
Top dressing is a valuable aid to the cultivator, especially where the soil is shallow, sandy, or impoverished, or when the plants make poor growth. The best time to apply it is when the shoots start to rise in spring and before the buds show. A good top dressing consists of leaf mould, old hot bed manure, some sifted mortar rubbish, with a good sprinkling of soot and bonedust, mixed well together and spread over the bed to a depth of 2 inches, working it around and between the plants. Water this well in and the result will soon be apparent, for the roots will begin to work and soon improve the appearance of the plants. As the flower stems rise in the spring they should be supported, as in the early stages of growth they are very brittle and easily broken by wind. Laths used by plasterers are cheap and suitable. One-year-old plants are best supported by each shoot being tied out to a lath; older plants would need four laths placed in a square with reaper twine wound in the shape of hoops. This I find gives the plant a good support and a graceful appearanee. Nothing looks worse than slovenly tied-up Carnation plants. As the buds show form, if good flowers are required, they must be thinned. For ordinary purposes little or no thinning is required, but for show purposes not more than two buds should be left on a strong shoot, or one on a weak one. After the plant has done blooming the flower stems should be cut right down to their base.

ARBOUR DAY.

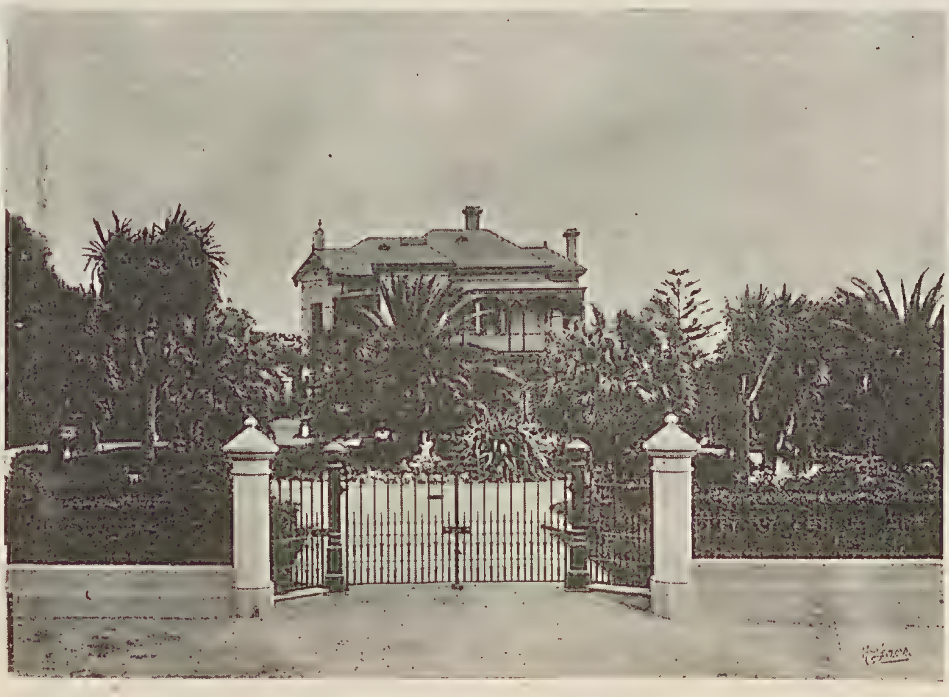
"Arbour day will make the country visibly more beautiful year by year. Every school district will contribute to the good work. The schoolhouse will gradually become an ornament of the village and the children will be put in the way of living upon more friendly and intelligent terms with the bountiful nature which is so friendly to us."—The results from the institution of Arbour Day is being universally acknowledged. Governor Roosevelt in his recent proclamation says: The school children of this state have planted more than two hundred thousand trees within the ten years in which Arbour Day has been recognized. Few similar efforts in recent years have been more thoroughly commendable than the effort to get our people practically to show their appreciation of the beauty and usefulness of the trees. The steady tendency towards the disproportionate growths of cities renders it all the more necessary to foster the things of the country.—'Park and Cemetery.'

"IVANHOE."

Residence of the Hon. George Brookman, Gilberton, South Australia.



— VIEW TAKEN IN 1888. —



— VIEW IN 1902. —

"Ivanhoe" is the suburban residence of the Hon. George Brookman, member for the Central District in the Legislative Council of South Australia. Mr. Brookman is one of several weathly, public-spirited and philanthropic gentlemen who have graced the public and private records of South Australia. It is not our business to attempt any detail of his life's work, which, by the way, he seems to thoroughly enjoy (long may he continue), that being the function of the daily Press, but amongst many other excellent qualities he has always been an enthusiastic gardener, even in his young days taking prizes at a juvenile floral society. The particular feature of his garden which he most enjoys is the Palms. This not so much because of his own success in growing them as by reason of the fact that his enthusiasm has spread so extensively. The cultivation of Palms is now not only a feature of many private gardens in the beautiful suburbs of Adelaide, where they were comparatively unknown twenty years ago, except with specialists, but all the public squares and plantations are now beautified with this handsome and graceful feature of landscape gardening. Safe to say that the surroundings of "beautiful Adelaide" derives a good deal of its present gracefulness from the munificence of Mr. Brookman in supplying many of the Palms, both on order from a nursery and from his own raising at "Ivanhoe."

We shall not attempt in the space allotted to give a description of the garden in detail, but chiefly confine our attention to the main features. In the first place we give a picture of "Ivanhoe" as it appeared shortly after it was built, and before anything is showing in the designs of the garden which was to be. The second picture is an illustration of the same place after 14 years of growth. It is hardly conceivable that after such a comparatively short period there should be a growth of Palms that almost hides the house from view when one stands at the gate. To get any view at all of the house the photographer was obliged to erect a high staging on the opposite side of the road. On entering the gate with the genial and hospitable owner of "Ivanhoe" at your elbow he starts off with that wonderful glibness of tongue acquired in the marble halls of legislature to explain the whole plan of the garden, giving the visitor the impression that he lives there in preference to any other lounge of luxury. He explains that the garden is designed to have plenty of sun and air, wide drives and paths, and that his success depends upon keeping the ground always on the move, "pricking it," he calls it.

Surrounding the whole garden is a very finely-grown and well-kept Rhamnus, buckthorn (from a Celtic word rham, a tuft of branches) hedge. Immediately on the right and left of the entrance is a pair of Cordylines, stricta, the club Palm from New Zealand, supported by two fine specimens of Jacaranda Mimosifolia, and the shrubs and plants in close proximity on the right are Hibiscus grandiflorus, Yucca aloifolia, Prunus (Japanese white plum), Cactus (opuntia) Indian fig, Strelitzia (traveller's tree), and the smaller growths of Diosma, Roses, &c., with annuals in the foreground, and the whole backed up by a dense mass of foliage of oranges, cumquats, mandarins, pittosporum, and stercuia. Anything like monotony of foliage is relieved by a fine spreading specimen of the Phœnix Reclinata Palm. All this to the right can be taken in from the view at the fountain in the centre of the pictures, in which Mr. Brookman will tell you that all the children in the neighbourhood have dipped themselves accidently, or otherwise.

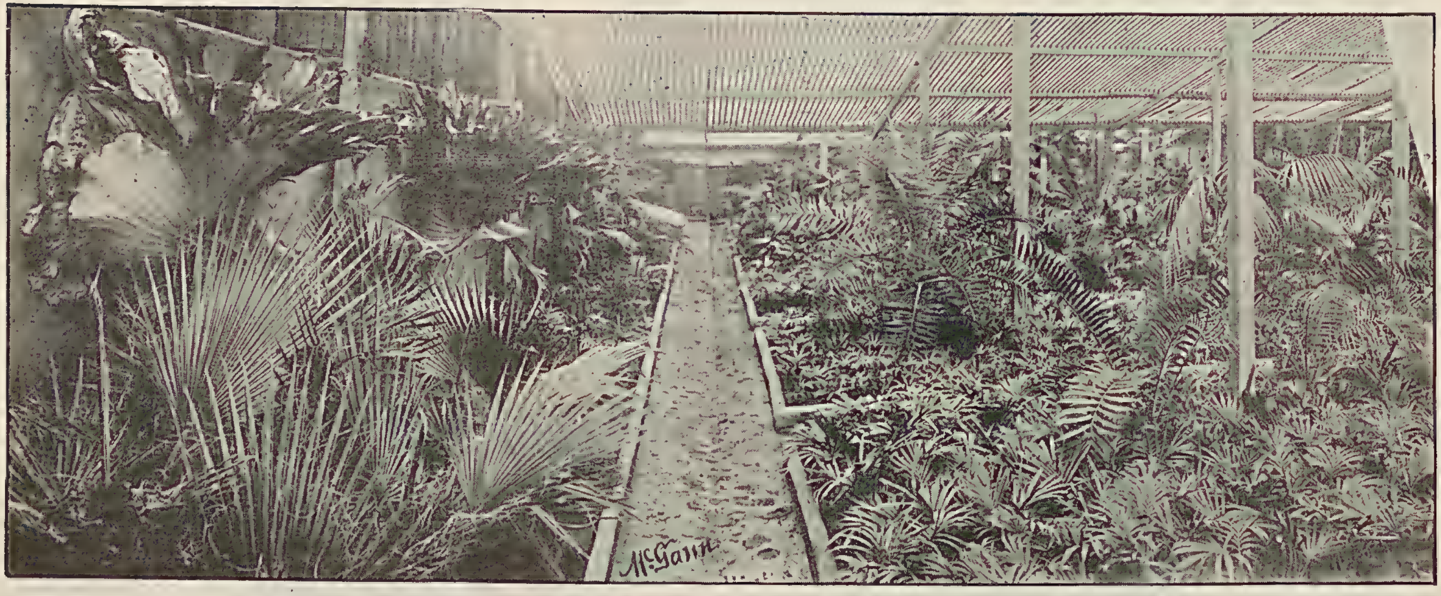
The centre lawn with the fountain in the foreground is planted with two pairs of Pritchardia (named after W. T. Pritchard, author of Polynesian Reminiscences) filamentosa palms on each side of the Phœnix reclinata in the centre. Fourteen years ago these palms were taken out of 6 inch pots, and planted where they now stand with their present butts of 11 feet in circumference. If the difficulty of taking in these statements might be a justification for doubting their veracity our first picture of the house is taken with an apparatus which does not lie (so it is said), and the palms can hardly be seen therein.

Now having walked somewhat in wonderment around the right side of the drive to the corner of the house, Mr. Brookman calls attention to a Norfolk Island pine (Araucaria excelsa), which was planted when 12 ft. high at the same time as the palms, and notwithstanding that one night rude Boreas broke off 8 ft. of his top growth has now attained a height of some 30 ft. This majestic tree stands at the rear of a bowling green of mixed rye grass and couch, (Triticum repens), looking beautifully green in the winter with the rye and equally fresh in the summer with the couch. Flanking this is a row of Elms (Ulmus campestris), Silver Poplars (populus) and white Cedars (Cedrus Atlantica), and one or two of Peppers (Schinus Molle). Beyond this are the orchard and kitchen garden.

Passing in front of the house, and to the left of the picture we enter the fern house, with artistic rockery of Murray river stones beautified by ferns and graceful and beautiful foliage plants looking fresh in the constant dripping of water, and setting off the limpid pools, where golden fish move in their rhythmic courses. Space forbids us to linger here, but in passing out Mr. Brookman points out a little palm sent to him from Central Australia which is waiting for a botanist to name for him. Passing down the walk on the left of the picture, and towards the entrance, we first notice a fine specimen of the Carob tree (Ceratonia siliqua), pods of which he uses in the feed for his first prize carriage horses in the splendidly kept stables, at the rear of the house. The border of the side walk is wholly taken up with a fine array of zonal pelargoniums of infinite variety. The eye is naturally arrested by the palms again and they are all splendid specimens of Phœnix (Greek name of the date palm) dactylifera, chamaerops (chamai, dwarf, and rhops, a twig—fan palms) excelsa, C. humilis, C. fortunei, and Corypha—fan palm (from Koryphe, the summit, leaves growing on the top) Australis. Passing by a circular bed can be noticed a ring of Cannas—Indian shot (the Celtic name for a cane, or reed) which Mr Brookman was one of the first to introdue some few years ago.

The visitor may linger long upon many features of special interest in this garden, and as he again approaches the entrance gates of "Ivanhoe" he must needs congratulate the owner of the grounds upon an interesting and diversified garden, which is evidently to him "a joy for ever."

PALMS.



Our illustration, kindly lent by Messrs. J. L. Bonython & Co., gives an idea of one corner of what is perhaps the largest Palm Conservatory in Australia. The construction of the place is the simplest thing imaginable, the architecture consisting of uprights, crossbeams, and flat roof of laths. This simple design appears to serve Mr. Sewell's purpose well enough. On the left side of the footway, immediately in front of the fine specimen of Staghorn (Platycerium Grande), is a strong plant of the increasingly popular Pritchardia Filmanentoa. In the centre of the picture, on the right of the path, is a Phœnix Reclinata, surrounded by plants of Kentia Forsteriana. In the right foreground is seen a specimen of Eucephartos Alstentia (native of the Cape), and that on the extreme right is Belmoreana, species of Kentia. The visitor to this nursery can wander in and out, up and down for hours amongst ever-changing varieties of Palms and Ferns, and wonder why they are not more popular with small garden growers, because of their healthy hardihood and quick-growing powers.

The large order Palmæ or Palmaceæ is pre-eminent in the whole world of plants for the grandeur and beauty attained by many of its species. Some tower, when full grown, to a height of considerably over 100 ft. without emitting a single leaf; others have stems not exceeding 2 or 3 ft. in height and ¼ inch in thickness; and others, again, have the stems so short that the leaves borne on the top of the stem rise out of the soil, and the whole plant does not reach 3 ft. in height. The tall-growing species can only be accommodated in botanic gardens and princely establishments, such as the winter gardens of the opulent, and even in these, however spacious the accommodation, the specimens never attain the wonderful beauty of the same subjects in their native forests. The dwarf Palms, however, are no less graceful than their lofty allies, and better adapted, from their low stature, for general cultivation.

A Palm stem is usually unbranched from the ground to the top, though that of a few species furcates, in some instances, several times. Once formed, the trunk increases in height, but not in thickness, tapering upwards almost from the base and generally erect. Its outer surface is usually very hard and the centre is soft, so that this can be easily removed, leaving a hollow tube. The leaves vary, but may be referred to two leading forms—(1) The feather-leaved, in which the leaflets arise from the sides of a long midrib, such as in Phœnix rupicola; and (2) the fan-leaved, in which the midrib is so short that all the veins seem to arise from the top of the leaf, and to spread out like the ribs of a fan through the leaf-blade, such as Livistona australis.

In the very young state the leaves of almost all species of Palms are undivided, except at the tip, and the species are remarkably alike in most cases while young. The inflorescence is simple or branched, and bears numerous inconspicuous flowers. Individual plants, or individual inflorescences, in many species, are either male or female, but in most the same bunch bears flowers of both sexes, the females usually lower down, and the males nearer the tips of the branches. The fruit also varies greatly.

The majority of Palms are by no means difficult to cultivate. All of the species require good drainage, as in summer they need a plentiful supply of water, and in winter, too, their roots must never suffer from lack of moisture. One species, Chamærops or Trachycarpus Fortunei, is hardy enough to live outside in many favorable localities all the year round, and several species are available for sub-tropical gardening in summer, and succeed in a warm greenhouse in winter. A few thrive in greenhouses and conservatories at ordinary temperature (40 deg. to 45 deg. at night, and 45 deg. to 50 deg. by day in winter), and many others of the tenderer description may be used for conservatory decoration in summer, transferring them to warmer quarters in the autumn.

As exhibition specimens, large plants may be successfully cultivated in pots or tubs, small in proportion to the size of the plant. For dinner-table decoration some of the elegent habited Palms in a small state are indispensable, and no better subjects for the purpose exist. As room plants, some of the stiffer-growing species are remarkably well adapted, as they withstand the confinement and indifferent treatment, even for a long period, in a surprising manner. Palms, therefore, represent an invaluable class of plants, and the most useful species are indispensable for effect in the decoration of the home.

A few select species are Latania borbonica, Kentia Belmoreana, K. Forsteriana, K. Canterburyana, Areca Bauerii, A. lutescens, Seaforthia elegans, Thrinax radiata, Phœnix reclinata, P. rupicola, Rhapis flabelliformis, R. humilis, Geonoma gracilis, Cocos flexuosa, C. Weddeliana, and Chamærops humilis.

All the species mentioned except those of the genus Rhapis are increased by imported seeds. The Rhapis species are propagated by suckers, and a few other Palms may be thus increased; but the general mode of increase is from seed. This is a very interesting process, as many lovers of palms like to raise their own plants and note them in their several stages of development.

The seeds of Palms vary considerably in size and form. Seeds may be sown at almost any time of the year—early spring being that preferred. The seeds should be sown thickly, in clean, well-drained pots, pans, or boxes, and covered with about their own depth of soil. The compost for all the strong-growing species may consist of 2 parts of turfy yellow loam, and 1 part of sharp silver sand. The soil should be made rather fine, and as the seedlings must remain, in many instances, a long time in the seed-pot, pan, or box, the kind of soil and the amount of drainage are important considerations. For many of the small or slender growing species a small portion of peat may be added to the loam and silver sand, as this sometimes tends to encourage a quicker and better root action.

The pots, pans, or boxes should be plunged in or placed on a brisk bottom heat and kept watered, always moist, but never so excessively as to cause sourness. Nursery men use boxes, called propagating trays, 15 inches long, 9 inches wide, and 2 inches deep. They put Moss or siftings in the bottom, use no crocks, place them as thick as they will go, and just cover them with soil. The trays are placed under the stages of a warm house, anyhow near warm pipes, but some prefer a fibre bed with a brisk heat.

Some of the seeds germinate in a much shorter time than others, and also grow on faster afterwards. The seedlings are potted off when they have formed one leaf and a second is showing, always in advance of the third leaf, placing them in the smallest sized pot that will hold the roots without injury, and then arrange them close together in a house where a high temperature and moist atmosphere are maintained. The roots must not be cut, and the stem not buried, the base of the stem being just within or resting on the soil.

Repotting will need to be carried out according to the rate at which the plants grow, some progressing much faster than others, always taking the roots as a guide, not shifting them until these are crowded. As the value of Palms for decorative purposes mainly depends on a large size of plant for the small size of pot, the endeavor should be to give the smallest shifts in the young state consistent with the rate of progress made by the plants, overhauling these early in spring after they become established, and doing any necessary potting.

Palm seeds sprout in from two to three months, and require from six to eight months before being ready for potting. In about four years the plants are of serviceable size, grand plants for decorative purposes in 6-inch pots. By the rush method—high temperature, moisture, and feeding—deep green Palms are had in one-third less time, but they will not bear the hardships of decoration so well as those grown on more rational lines.— The Gardener.

✧ REVIEWS. ✧

KERNER'S "NATURAL HISTORY OF PLANTS," WITH BOTANICAL NOTES BY "S."

[We shall be pleased to review any books, magazines, or periodicals dealing with plants sent to us for that purpose.—Ed.].

Absorption of Water.—As a rule leaves are provided with hairs, or covered with varnish, and absorption of water is thereby prevented, but in many cases the water thus thrown off is led by special grooves to cavities provided with absorbing hairs, where the dew or rain is utilised. The proof of this is that if, say, leaves of the Gentian are "cut off and left to fade, and the cut surfaces are stopped with sealing wax, and the whole then bathed with rain water, they take up in twenty-four hours two-fifths of their weight in water."

In the case of some Saxifrages with toothed edges the teeth are rigid, but the space between soft and absorbent. In others the leaf is dotted with depressions, covered by a lid of lime kept in its place by little pegs or plugs. This lid lifts in wet weather to admit water, and closes down when the leaf is dry.

In some Tamarisks growing in arid steppes the leaf is covered with salt, which attracts moisture from the air, deliquesces, and runs into the cavities. In dry weather the salt acts as a protecting crust-preventing evaporation.

Symbiosis.—This is the technical term

applied to the "living together" of various organisms when each assists the other, not parasitism, but "chumming." The most important case is that of Lichens. These are now generally admitted to be algæ and fungi living together. The algæ are "groups and filaments of round, ellipsoidal, or discoid green cells," and the fungi "pale, tubular cells, destitute of chlorophyll," the algal cells being interwoven with the filaments of the fungus.

Another case of symbiosis is where the mycelium, or web, of a fungus grows over the root fibres of a flowering plant, and by absorbing water and its contained salts, helps to feed the shrub or tree. Some plants, such as Heaths, Daphnes, and Rhododendrons, seem to be dependant upon these fungi, and do no propagate if the roots are cleared of the fungoid mantle. Limes, Roses, Ivy, and Pinks, which are free from the fungus, can be propagated in damp sand; but oaks, beeches, heath, brooms, &c., whose roots have a mycelial mantle, will not continue to grow from cuttings in sand. If, however, the sand contains humus just taken from a heath, the cuttings will sometimes grow, the humus probably containing germs of the fungus. The fungus benefits by absorbing the juices of the tree. "The range of species which live in a social union such as is here described is certainly very large."

The tree appears to have some choice as to its companion, for the Japanese Sophora and the Australian Epacridae, are found in European gardens in social union with native fungi which certainly do not occur in Japan or Australia" respectively.

But the presence of a mycelium enveloping the roots of a flowering plant is not in all cases a proof of symbiosis. Thus Monotropa allied to the Primrose bears no green leaves, and in general possesses no trace of chlorophyll, and derives its nourishment from the fungus surrounding its roots; but the fungus does not penetrate the roots, so that it is not symbiosis, but the flowering plant is a parasite on the fungus.

Sometimes this symbiosis is of a more complex character: thus the greater part of the absorption roots of the Black Poplar are covered by a dense mycelial mantle, but where they are free they are taken possession of by the suckers of a Toothwort, and in the leaves of this (as already noted) are housed various small animals, such as Rotifers. Or the Poplar bears parasitic Mistletoe, and the Mistletoe is covered with Lichens, which again, as we have learned, are a community of algae and fungi. Reckoning the mosses, lichen, liver-worts, galls, beetles, butterflies, &c., living on a poplar, the number, according to Kerner, "is not much fewer than fifty."

Under the heading "Conduction of Food" the very difficult question of the ascent of sap to the tops of the highest trees is entered upon. "Capillarity" was first pressed into the service as an explanation, but the vessels of the stem and leaves are closed above and below, and at best capillarity could only raise the fluid a short distance. Then "Osmosis" was suggested—that is, the transpiration of fluid through the walls of the cell, these walls being so built up that the fluid would pass more readily in one direction than another, i.e., upwards more easily than downwards. Again, atmospheric pressure was made use of as an explanation, but with a perfect vacuum in the upper part of the tree the water could only rise about 30 ft. Then transpiration was brought in: by evaporation the contents of the upper cells become more concentrated and draw upon the next lower cells for fluid supply, these in turn upon those below them, and so on to the absorptive root.

However produced the quantity of sap in movement in a plant is very great. "In Java certain lianes are made use of as vegetable springs. The watery sap flows so abundantly from a cut branch that in a very short time it will fill a glass, and forms a cool and refreshing beverage." Even from a Rose more than 2 lb. weight of sap was exuded in a week.

Transpiration chiefly occurs through the leaves by means of numerous small openings called "stomata." These openings vary in size according to the dryness of the air, being opened or closed by a pair of kidney-shaped cells situated on the rim of the opening. It is evident that the moister the air the more difficult it is for plants to part with their excess of fluid, therefore, in the damp tropics we find the largest leaves. Thus the leaf blades of the Corypha palm of Ceylon are eight yards long and six yards wide. In Brazil the petiole of the Raphia palm is five yards long, and the blade 22 yards long and 12 yards wide—the largest leaf known. If such a leaf were propped up against a house it would reach 80 ft. in height, or half the height of the Post Office! As the stomata are invisible to the naked eye, imagine the countless millions on one such leaf!

(To be Continued.)

SPRAYING IN BLOOM.

[From 'Experiment Station Record,' Washington]

The practice of spraying fruit trees in bloom, as begun a few years ago, has led to considerable controversy as to the effect of such treatment upon the yield of fruit, as well as the injury to bees. As a result of the agitation a law was passed by the legislature of the State of New York prohibiting the application of poisons to fruit trees while in blossom. The effect of such treatment upon the production of fruit has been investigated at both the New York State Station and the New York Cornell Station. During the year 1900 extensive field experiments were conducted by the Cornell Station on spraying fruit trees in bloom, which showed no decisive results. The season was one of heavy crop and little disease, and good or fair crops followed all treatments. There was no apparent injury to blossoms on trees sprayed when in full bloom.

The effect of spray mixtures on pollen and blossoms was studied by the State station both in the laboratory and in the orchard. In the laboratory, pollen grains were put into culture which contained insecticides, or fungicides, and the germination and growth compared with others placed in culture media without any fungicide or insecticide. "From these ivestigations it appears that if before pollination occurs the stigmatic surface of the pistil should be covered either with Bordeaux mixture alone or with arsenical poison alone, of the strength commonly used in spraying orchards, there would be no germination of any pollen which might afterwards reach the stigmatic surface, and so fertilization would be prevented and no fruit would be formed. Even the presence of lime alone, of the strength commonly used in spray mixtures, prevented the germination of pollen. Bordeaux mixture was diluted in aqueous sugar solution to 500 parts, 200 parts, 100 parts, 50 parts, 2 parts, and 1 part in 10,000 of culture media into which various kinds of pollen were introduced. Even when diluted to 50 parts in 10,000 it prevented germination to large extent, and where germination did occur the growth which followed was decidedly slow, and the pollen tubes were dwarfed. When diluted to 100 parts, 200 parts, or 500 parts either no germination or practically none was found."

The effect of spray mixtures on the apple blossoms was examined, trees being sprayed in bloom and observations made at different times until the fruit had become as large as cherries. In the tests where the trees were sprayed repeatedly, so as to hit as many as possible of the new blossoms which opened from day to day, but few blossoms survived the treatment and but little fruit was set, showing that spray mixtures prevent the setting of fruit when applied to blossoms soon after they open. If the tree should have a scant amount of blossoms, serious loss might follow from such treatments. In some cases the spray mixture had a decided corrosive effect on the tissue of the stamens and pistils. In other cases pistils which showed the presence of spray mixture on the stigmatic surfaces awaited fertilization for several days, but eventually withered and died. It appeared that in these cases the spray mixture prevented the process of fertilization. Blossoms which had been opened several days before being sprayed seemed to have reached a stage where the treatment did not check fertilization, and the fruit fruit was set as abundantly as upon those trees which were not sprayed. The effect of spraying in bloom upon the yield was investigated with a number of varieties of apples. In the case of Hubbardston the loss per tree from spraying in bloom was 0.9 bu. of marketable fruit; with Oldenburg and Baldwin the loss was 0.4 bu.; with Tompkins King, 1½ bu., and with Rhode Island greening 1¼ bu. In some cases the spraying in bloom thinned the fruit, and the thinning done seemed to produce results somewhat similar to those produced when the young fruit is thinned by hand, that is, the total yield is slightly decreased, but the amount of marketable fruit is not in any way diminished. Other experiments gave contradictory results, and further tests are needed to establish a safe general conclusion on this point.

THE ORCHARD.

CULTIVATION OF THE APPLE.—(Continued.)

By Mr. S. Shoobridge.

Pruning.

The first year the tree should be pruned with the buds outwards, to form the tree as soon as possible, which should be accomplished in the first five years. The ideal tree in Tasmania should be formed on the lines of an inverted umbrella, and should the same, from whatever cause, be weakly, it is advisable to remove most of the spurs and fruit buds, the main object being to produce at the outset a vigorous tree, and not fruit, which will come later on. The reason for training the tree after the fashion of an inverted umbrella is to secure the maximum amount of sunshine and atmospheric circulation, thus producing large and well-colored apples. Root pruning is not sufficiently practised in Tasmania. This can be done in winter with a sharp spade, and care should be taken not to bruise the roots in any way which would render them liable to become a nidus for blight or other disease. The object in this branch of an orchardist's work is to sever the main roots, thus producing lateral ones and small feeders. Severe pruning and bud pruning have, as yet, been little practised in this State, but in different parts of America the results have been most successful. The method is to disbud in the winter, pruning all lower buds to about two feet from the ground in dwarf trees, and thin all fruit buds to one or, at the most, two, with the result of a much finer class of fruit from less blossom and a marked resistance to late frosts. Bud pruning must not be done promiscuously, as certain varieties do not require it, notably the Cleopatra, the tendency being to drive them to wood; but in the case of the Scarlet Nonpariel, King of the Pippins, French Crab, and Sturmer Pippin, which are most prolific bearers, and inclined to bear small-sized fruit, you can, by this method, produce apples of large size and good color.

Cultivation and Irrigation.

Most of the ploughing and digging should be done in the autumn. The ground should be thoroughly moved to a depth of one foot, so that the sun and air can thoroughly pulverise the soil. Land with a large percentage of clay cannot be dug too roughly, as long as it is thoroughly moved, the winter frosts being powerful disintegrators. Light soil should be thoroughly broken down, otherwise it will remain in hard clods. Throughout the summer the land should be kept thoroughly stirred and all weeds destroyed, this being best accomplished with a light American scarifier and disc harrow; but on no account should this operation take place when the soil is wet.

Irrigation should begin in December, and great care taken not to let the water lie. The great secret in irrigating is to keep the fruit growing, as then it will fill out and thoroughly mature. If the fruit is allowed to stop growing and then watered it will not keep, hence the impression watered fruit will not keep. In parts of America winter irrigation is practised. It has been tried in Tasmania, but the results are doubtful.

Manuring.

In manuring for a given object, it is necessary to know the composition of the matured product for a guide as to what should be applied. The following represents the mineral composition of the apple:—

Potash	35.66 per cent.
Soda	26.09 per cent.
Magnesia	8.75 per cent.
Lime	4.08 per cent.
Iron	1.40 per cent.
Phosphoric Acid	13.69 per cent.
Sulphuric Acid	6.09 per cent.
Silicic Acid	4.32 per cent.

An analysis of the soil will reveal the presence of all or any of the above being in abundance or deficient, but too much cannot be taken for granted if the former condition prevails, as it is more a question of availability rather than actual quantity. Lime is one of the best materials that can be used, although not strictly a manure in its action. It sets free the chemical constituents of the soil, and promotes a crumbly structure, making the land easy to work. It should be lightly worked into the soil in the autumn. Farmyard manure, when obtainable, will aid in the maintenance of the humus in the soil, as well as add to fertility. The ploughing-in of leguminous crops is another method of keeping up the supply of humus, as well as nitrogen. The application of such fertilisers as phosphates and nitrates will, in great measure, depend for success upon the discrimination of the grower in regard to the condition of the soil and the trees. Potash is, of all manures, one of the most important for fruit growing. Its high percentage in the composition of the apple, as well as its tentency to render the foliage immune from insect depredations, have made this mineral very popular amongst fruitgrowers. The presence of lime in the soil for the best results when using potash for fruit trees is being better appreciated in this State.

Diseases of the Apple and Treatment.

Apple growing, or, for the matter of that, any fruit culture, is not simply a matter of planting the trees and cultivating the land. Were this the case under our existing favorable conditions, there would not be much profit in the business. Destructive agents, both insect and fungoid, claim a large annual share of the orchardist's product. At the same time, it must be recognised that if every apple which set matured, prices would be considerably reduced in seasons of heavy yields. The ideal orchard is one which produces annually a good average crop of the finest marketable apples. Fruit pests not only destroy a large quantity of fruit, but they largely reduce the value of what is marketed by an indirect influence on the vitality of the tree. The only course open to a grower is to endeavor to control the pests by artificial means, and thin out the fruit when heavy yields occur. Whilst in this State we are still free from some of the worst pests to be met with, yet the following will be found of quite sufficient magnitude and destructive power to absorb the orchardist's attention when present.

The Codlin Moth (Carpocapsa Pomonella.)

In favorable seasons the above is a very troublesome pest, and yet the adoption of the several methods prompted by a knowledge of its life history and recent experiments will materially curtail its destructiveness. Banding the trunks of the trees in the spring and picking the infected fruit—a provision of the Legislature in this State—is an effective course of procedure, if concerted action could be secured; but experience shows that too much cannot be relied on in this respect, owing to the apathy of small fruitgrowers. It, therefore, devolves upon the progressive orchardist to adopt the more advanced method of using arsenical sprays. Many will be found in works on horticulture, as also the method of application; but some little tenacity of purpose on the part of the user must be cultivated to overcome the vagaries of climate, as rain, following on spraying, if in any quantity, necessitates a repetition of the operation.

Black Spot (Fusicladium dendriticum) is, perhaps, the most formidable enemy to apple growers in those parts of the State where the climatic conditions favor its development. The writer, however, is glad to learn of the success attending the use of the Bordeaux mixture in the repression of this fungus. Several scale pests, notably the mussel scale (Mytilaspis pomorum) have to be reckoned with, but where remedial measures have been attempted satisfactory results have been secured. I regret that want of space forbids even a passing reference to several other minor pests.

Gathering and Storage.

Fruit should not be gathered until it is full grown, well colored, and the pips turning black. This is as it should be picked, not as is often the case in Tasmania, when it is picked before properly matured, owing to the early shipment of apples to London. These early shipments, causing growers to fill allotted space with immature fruit, are the chief reason for the complaints that the fruit in the commencement of the season at home is shrivelled, not colored, &c. We cannot, therefore, hope to cempete satisfactorily in the two first boats with our neighbors in South Australia and Victoria, owing to their fruit maturing at least a fortnight earlier than that grown in Tasmania. At the same time, taking the London season all through, our returns compare quite as well as those received by shippers from the mainland. To cite one instance. I know a certain grower in Tasmania whose shipments of never less than 2,000 cases in any one year have averaged nine shillings, f.o.b., Hobart, for the last four years. It would be well at this juncture to emphasise the fact that too much care cannot be given to the grading and packing of all fruit, whether for shipment to England or Interstate markets.

Apples for storage should not be picked until the pips are quite black. The fruit has then an oily feeling, and should be placed in a store with an even temperature and thorough ventilation, and should not be touched until required for shipment.

Marketing the Fruit.

In the present state of the trade this is the most important, as well as the most difficult, matter in connection with fruit growing. Taking the English market first, one agent should be selected to receive the fruit, which should be sound, well-colored, and graded. Each grower now by law must have a registered brand, and should ship none but first-class fruit under it, as in a few years the brand will sell the fruit. This applies with equal force to all markets. It is advisable to either sell all your fruit in Tasmania or ship all; if part is shipped and part sold neither seller nor buyer is satisfied. I have tried both plans, and say unhesitatingly it is bad policy to adopt half measures. Trial shipments by growers to fresh markets in a small way is becoming desirable, owing to the ever-increasing production and competition from all parts of the world.

Care should always be taken to have a clean, white case, without any stains, as the more attractive the package the better price the fruit realises. In shipping to England the best paper should be used, as cheap paper allows the moisture from one decaying apple to spread to another, causing further damage. When procurable, wood-wool should be used on the top and bottom of the apples, as it acts as a pad, and keeps the fruit from undue pressure; if not procurable, paper shavings are a fair substitute.

Spraying for Fungus Diseases.

———o———

From the "Journal of Agriculture," Victoria.

By D. McAlpine.

In 1882 Millardet, at Bordeaux, in France, found that a compound of bluestone and lime which had been applied to some vines to prevent the fruit being eaten, had a most remarkable effect in checking the dreaded mildew.

This compound, now regarded as the best all-round fungicide, received the name of Bordeaux mixture from its place of origin. Since then various preparations have been brought forward for similar purposes, and of these there may be mentioned the Ammoniacal Copper Carbonate, the Copper-Soda, or Burgundy Mixture, and Copper Acetate. Each has special features of value, but none have so far proved as satisfactory for general work as the Bordeaux. For this reason discussion here will be restricted to the methods of manufacture and employment of.

Bordeaux Mixture.

As has been said, the mixture is a compound of bluestone and lime. There are no strictly defined proportions in which these constituents should be mixed, though it is known that the lower the proportion of lime present, provided the mixture is not acid, the more satisfactory are the results. This is clearly shown in experiments at Pakenham last year, when the 6.4.50 formula gave 57 per cent. of absolutely clean fruit, the 6.8.50 only 18 per cent., and the 6.12.50, barely 12 per cent. The first figure in the formula represents the quantity of bluestone in lbs., the second the lime in lbs., and the third the water in gallons.

It is sometimes stated that no injury to the opening leaves or flower buds will result from a large excess of lime. This is quite contrary to the results in last year's experiments. At Pakenham, it was found that a 6.4.50 Bordeaux caused no injury to the young buds, but considerable harm occurred with a 6.8.50 formula, while the 6.12.50 was quite as severe as a plain solution of bluestone. When it is desired to keep down the proportion of lime to the lowest possible point consistent with safety, then the use of the Ferrocyanide test will enable this to be done. Dissolve 4 oz. of ferrocyanide of potassium in one pint of water, and add a few drops of this to a small quantity of the mixture to be tested, placed in a glass vessel for preference. Should any brownish discoloration occur, then the mixture does not contain enough lime; hence, lime milk must be added till, on testing, no discoloration is apparent.

The 6.4.50 formula is recommended as the best and cheapest for general use, though in wet districts the quantity of water may be reduced to 40 gallons. At the same time it is well to state that more profitable results and higher percentages of absolutely clean fruit are expected not from more concentrated mixtures, but from the addition of small amounts of certain substances likely to increase the adhesiveness and spreading power as well as poisonous action of the more dilute formulas. The substances which have given good results so far are Sal-Ammoniac, Saltpetre and Salt, any of which may be added to the lime milk at the rate of 1 lb. to every 50 gallons of Bordeaux Other substances worthy of trial on a small scale are Nitrate of Soda, Silicate of Soda, Sulphate of Ammonia, Sulphate of Lime (Gypsum), Sulphate of Potash, and Sulphide of Soda. When either Sulphate of Ammonia or Sal-Ammoniac is added to lime, ammonia is given off slowly, so these additions should only be made just before using the spray. Attempts will be made to ascertain whether these or any other of the substances named would prove more useful if added, in solution, to the finished Bordeaux.

How to Prepare Bordeaux.

For the proper preparation of this mixture three or more barrels are essential, and two of these should have a distinct mark on the inside to indicate when they contain 25 gallons, as much valuable time will then be saved and strict accuracy insured. Though bluestone is easily soluble in cold water if suspended just below the surface, the process is much more rapid if the water be first heated. Take 6 lb. of bluestone and place it in a small sack, such as those in which sugar is generally sold. A kerosene tin of hot water should then be poured into one of the marked barrels, and the bag of bluestone either suspended just below the surface of the water, or it may be held by the top and agitated until complete solution is secured. When this has occurred, make up to 25 gallons with cold water. Then take 4 lb. of good fresh quicklime in hard lumps and slake it in the other marked barrel, adding only a very little water at first, about a pint is sufficient. When this has been absorbed add a little more, and so on from time to time, till all the lime has crumbled down, care being taken not to let it get too dry. In this way a good lime will furnish a smooth thick paste practically free from lumps. Make up to 25 gallons by adding cold water, and stir thoroughly. When both milk of lime and bluestone solution are quite cool, they should be poured evenly together into the third barrel, capable of holding 50 gallons. To secure even mixing, which is of considerable importance, the barrels for the bluestone and the lime should be mounted on a raised platform and furnished with wooden taps, and the liquids may then be run in V-shaped troughs, into the third barrel arranged underneath. On the top of the latter should be placed a large wire strainer on a movable frame to prevent the entrance of grit, and, lastly, a thorough stirring should be given to the mixture for a couple of minutes.

When large areas have to be sprayed it will be found most convenient to erect the platform at the edge of a dam, or in any situation where water can be obtained from a pump or tap, and a small force pump fitted to the mixing barrel will prove very useful for lifting the Bordeaux into the spraying machine.

A Special Warning.

Poor or air-slaked lime should never be

used, as no amount of the latter with bluestone solution will produce a Bordeaux mixture. It is certain that much non-success in spraying is due to the use of air-slaked lime, which is largely chalk. When a milk made from this is mixed with a bluestone solution, a precipitate almost entirely chalk, rapidly settles to the bottom, leaving a clear blue solution of Copper-sulphate, occupying about nine-tenths of the vessel. When good fresh lime is not easily obtainable it will be found more satisfactory to use the Copper-Soda Mixture instead.

Stock Solutions.

There are doubtless some who, to simplify the process of manufacture, would prefer to use stock solutions. A convenient method is to dissolve 100 lb. of bluestone in a 50-gallon cask; after filling the barrel with water every gallon would hold 2 lb. of bluestone. Similarly 100 lb. of lime could be slaked in another cask and made into a paste, perhaps reaching to a mark corresponding to 25 gallons. Then to make up the 6.4.50 formula, take 3 gallons of stock bluestone and put into one barrel, making up to 25 gallons with cold water, and 1 gallon of lime paste, after thorough stirring, should be placed in the second barrel and diluted to 25 gallons. The after procedure would be the same as previously described. If lime paste is to be kept for a few days, then it should be covered with about 6 in. of water.

Bluestone and Soft Soap.

A simple solution of bluestone, 2 lb. in 50 gallons of water, with 4 lb. of soft soap in addition, is a cheap and valuable fungicide for use in comparatively dry districts. Owing, however, to its strongly acid nature, it is liable to cause considerable scorching of the leaves if applied after the buds burst, hence it is advised for use only before the blossoming.

When to Spray.

When Bordeaux mixture was originally introduced, much stress was laid upon the necessity for winter spraying. Considerable misapprehension seems to have arisen from the use of this term, as many growers have done the work in midwinter and afterwards found no great benefit. It may be taken for granted that every one wishes to get the best possible results from one spraying alone, there being no desire to repeat the operation if it can be avoided. It will be found more satisfactory not to commence till the buds are on the point of bursting. Trees which bloom before any appearance of green can, with safety, be treated up to the time when the first few flowers have expanded, and the rule is that the nearer the spraying to the opening of the flowers the more efficacious will it prove. In other trees such as apples, where the flowers are borne in clusters encased in leaf-like organs, it is best to wait till these latter are partially open. No appreciable damage will occur even from spraying when apples are in full bloom if properly prepared Bordeaux mixture is employed. In the case of Copper-Soda, such late spraying should be done cautiously, and not less than 9 lb. of washing soda used to every 6 lb. of bluestone in the 50 gallons of water.

To enable all to appreciate the advice just given as to the time of spraying, it may be said that the object of the treatment is to kill the spores of the fungus which are entangled in the bud scales, and this is more easily done when they are commencing to germinate. The spore itself has a tough coat and is much less readily destroyed by contact with poisons when in a state of complete rest, as in midwinter, than when germinating or about to germinate in the early spring. Researches by J. F. Clarke have shown that a germinating spore has a certain solvent action upon dried deposits of copper compounds with which it may be in contact, and, in fact, the process of germination itself sets free the poison which kills the spore. Thus it is seen that by spraying too early, when the tree is quite dormant, we are applying the fungicide long before it is wanted, and, in addition, subjecting it to the influence of rain and other agencies likely to wash it off or destroy its usefulness.

How to Spray.

It is well to note that good results can only be insured by the use of properly prepared mixtures applied with good machines. A first-class pump, easily worked and not liable to get out of order, is an absolute essential. With Copper-Soda or Bluestone a very fine nozzle can be employed, as there is no grit to cause stoppages. In using Bordeaux a nozzle easily cleaned is very desirable, though thorough straining will be found to greatly reduce the possibility of choking. A fine spray, lightly coating the whole of the tree and particularly the growing shoots and the fruit buds, is what should be aimed at. The tree should not be drenched so that the mixture runs off in quantity, for it is found that in such cases a lesser quantity adheres, and this is why it is sometimes recommended to give two light sprayings at intervals of a few hours.

If the instructions given in this article regarding the manufacture of Bordeaux mixture, the time and method of application, are carefully followed, it is safe to say that no serious losses are likely to be sustained from the attacks of our more common fungus parasites.

Selecting Orchard Trees.

By C. Bogue Luffmann.

To the average purchaser a tree is simply a tree. If he wants one thing more than another it is plenty for his money, but whether in length or breadth, he does not care. The way in which the tree has been fashioned, the combination which has been made with regard to scion and stock, the soil and climate in which it has grown, and their effect on its final development, are subtleties of which he is innocent.

But, as all depends on trees having a fair start, consider the essentials of a good tree at the time it leaves the nursery.

1. It must be worked on a stock appropriate to its own nature, and the soil and climate in which it is to grow.

2. The stock must be young, shapely in every way, free from heavy wounds and disease.

3. The peach, apricot, nectarine, cherry, apple, plum, pear, orange, and lemon must be raised from budded stocks, and worked low in order to insure strong, straight trunks, such as are desired in hard hot climates. Strong varieties of pears, if to be planted in rich cool soils, will grow large enough and mateure early if raised from grafts and worked high on the stock. Top-grafted young trees are practically useless in a hot climate.

4. The scion and stock must be about the same size, and the callus at the point of union must be perfect. This is especially necessary in stone and citrus fruits.

5. The roots must spread out in all directions and make a circle at the base of the stem. Not all heavy or all fibrous, but a regular arrangements of roots of different sizes characterise a healthy root system. A kind of crutch-stick root growth is a serious defect in any tree. It is invariably due to slovenly and hasty planting.

6. The roots of a young fruit tree should on no account be allowed to get dry; hence damp packing material is indispensable—especially in this country of big distances and high temperatures—and no intelligent man would expose the roots of trees to the drying and perishing influences of the air, and then send them out in dry wrappings.

7. The stem may be long or short, stout or light, according to the strength, nature, and habit of the tree. In all cases the stem must be stout enough to support a good sized and profitable head. The stem must show signs of being made in one season. No weakly tree should have its trunk built up in two or more years, as no value can come of such weaklings.

8. A yearling tree should be a strong, straight shoot, destitute of branches below the line where it is desired to work the head. A yearling should not have been pinched in summer or interfered with in any way.

9. A two-year-old tree should be composed of a straight well-ripened and mellow barked stem, surmounted by three or four evenly disposed and more or less equally robust branches. These branches should not have been pinched or interfered with in any way during their growth, and they must be perfectly ripe, and their leaves experience a natural fall. Should any portion of the stem or branches be unripe when the leaves fall no useful growth may be expected from it.

10. Sun-scald, bad digging up, and injury to roots, drying out of roots, barking of trunks, are common misfortunes which act seriously against young trees.

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7, 8. Benalla Agric. Soc.—R. Blackburne.
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15. Maitland Agric. Soc.—Jas. Tiddy.
15. Tarlee A. & H. Soc.—J. Nicholl.
22. Minlaton Agric. Soc.—D. G. Teichelmann.
29, 30. Millicent A. H. & F. Soc.—G. D. E. Plunkett.
30. S.A. H. & F. Soc. Rose Show, Town Hall, Adelaide.—W. Champion Hackett.

SOCIETY MEETINGS.

4. S.A. Gardener's Society, Waymouth-street, Adelaide, 8 p.m.—J. P. Knight.

The Australian Gardener.

WEDNESDAY, OCTOBER 1, 1902.

Editorial.

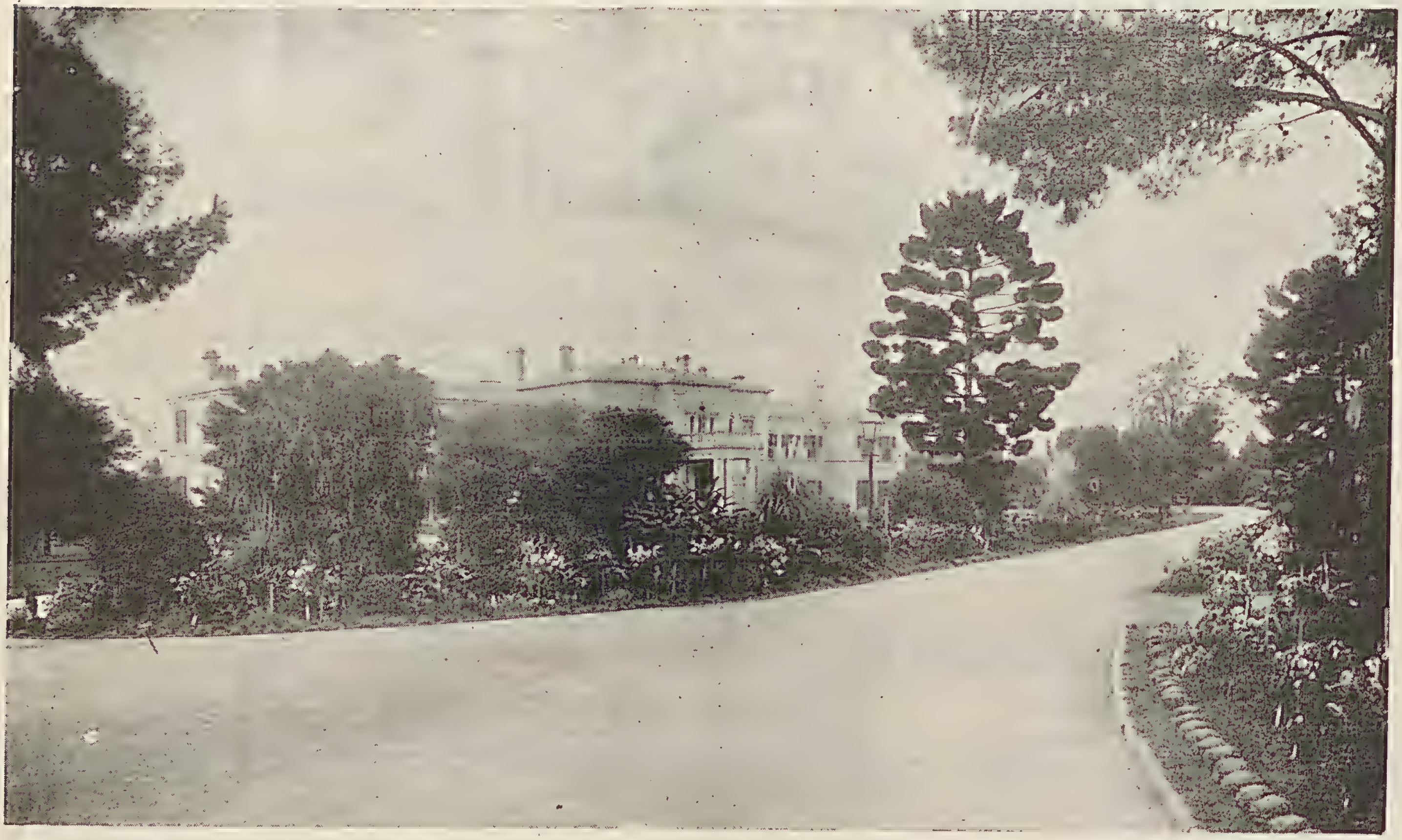
THE success that has attended the efforts of all who are associated with the publication of "The Australian Gardener" may now claim it as the leading paper of its kind in the Commonwealth of Australia. The need for such a publication had long been felt by the amateur, the student, and professional gardener, and the number of congratulations received by the Proprietary are most encouraging.

Our aim has been not only to make the paper interesting to the general reader but instructive and encouraging to many who are fond of flowers and gardening, but for the lack of general information upon the various kinds of flowers, fruits, and vegetables, and how to deal with them, have not made the displays and use of the economic values of their gardens they might have done

There is not a living soul that does not admire a garden and enjoy its beauties, but the enjoyment is enhanced a hundredfold by the actual production of one's own handiwork. Apart from æsthetic value of enjoyment the work may be made profitable. Every man or woman who has twenty square feet of ground at their disposal may by a little systematic effort, make it beautiful and at the same time profitable. If profit is the object to be aimed at, a single bed of vegetables may keep the kitchen for many months in the year. And what vegetables compare with those that are grown on the premises. By the majority of those who have not tried gardening for profit it is thought that a lot of special knowledge and great labour is required, whereas in point of fact a little knowledge and experience combined with attention are the necessary qualifications. Seedsmen and nurserymen and gardeners are always only too willing and pleased to give practical information to the cottage gardener and the householder and the columns of the "Australian Gardener" will always be found full of information for every month's work in the year.

By almost every mail we receive catalogues from seedsmen and nurserymen, and prize lists of shows being held everywhere at this time of the year, and we shall be pleased to supply information upon them to any enquirers. Amongst others we have received a hand book on gardening from the publishers Messrs J. Walsh & Sons, of Hobart. This little manuel contains a deal of seasonable information upon the open flower garden, the greenhouse and conservatory, and the fruit garden.

GOVERNMENT HOUSE, ADELAIDE.



THE gubernatorial residence of the representative of His Majesty the King in Adelaide is all that could be wished for in the matter of position, and that is the best that can be said regarding the building. In point of architecture the word "ramshackle" would not be an inappropriate description. In point of beauty it has none, and in merit of stability the earthquake shock tried it severely, in fact another good shaking would demand the serious consideration of the State Treasurer and the taxpayers. But we have nothing to do with the building other than to say that the resourcefulness of the gardener is largely taxed to hide as much of it as possible with his landscape art. This in previous years has been no trifling matter. The care of the property was in the hands of each Governor, whose tastes in the matter of landscape gardening varied in an aggravating fashion, and, needless perhaps to mention it, the lady of the household had taste or no taste, all of which the gardener had to submit to. A drive would be required here, a lawn there, a grove somewhere else, and so on, until the grounds in their states of transition lost all sense of a respectable character, and the wonder is that it looks as well as it does to-day.

The grounds are now under the control of the State, and the head gardener, Mr. Stenning, who has not long been in control, is making the surroundings of the house something like what a visitor might fairly expect to see at such a place.

The illustration by our photographer was taken some time ago while the Chrysanthemums were in full flower, giving the picture a bright relief. The landscape aspect may be said to consist of a wide drive leading around a spacious lawn in front of the house, with a deep border of trees, shrubs, and annuals in the immediate foreground of the picture. Passing the sentinel at the front gates and turning to the right of the picture the forest trees noticed on the border hiding the high street wall have been growing there probably since the place was laid out, and fine specimens of giants they are. The Pinus Halepensis partly taken in on the right of the drive towers up a good height. Eucalypts of a hybrid character, Peppers, Figs, Carobs, Aurarcaria Bidwelli, Sterculia, Grevillea Robusta, varied by Yuccas, Wigandia, Agave, Cordylines, Lauristinus, Privets, Acacia siligna (Western Australian Waterfall Wattle), Hibiscus, Viburnum, Tecomas, Vitex Agnus-Castus, Jasmine, Spiarea, Hakeas, Brugmansia, Double White Peach, Abutillons, and other varieties that give a great combination, if somewhat haphazard background. The edging of this border is planted with Echeveria, Iberis, Centaurea, Bicolor Pelargoniums, Stocks, Acroclinium, Chrysanthemums, Salvias, and Asters. Before turning away to the left-hand side of the drive attention is claimed by a fine specimen of Sphaeralcea umbellata in full crimson bloom.

After admiring the great growth of Auracaria Excelsa, showing up well in the right foreground of the picture, backed up by one of the American evergreen Oaks (Ilex), regarded by Mr. Stenning as the finest tree of its kind in the State, and trimmed to a graceful cone shape, we retrace our steps to note the border taking up the centre of the picture. In the immediate foreground is an Acacia native of the West, a perfect sight of golden yellow. A variety of Palms have been lately set out in the centre of the border of the Phœnix, Chamaerops, Kentia, and Pritchardia varieties, and when full grown will give a pleasing tone to the character of the surroundings. Here we find a miscellaneous collection of shrubs of greater and smaller growth. The old fashioned but ever welcome Fabiana, Bignonia, Salvias, and Abutillons, with Hollyhocks, Gladiolus, Arums, Stocks, Carnations, Bracychome, Viscaria, Asters, Daisies, Erythrina, Hibiscus Syriacus, and H. Grandiflora. Here we note that rare and pretty little blue Phaecelia Campanularia.

Now rounding up to the lawn, whereupon the viceregal visitors desport their gay trimmings on days of great note in the calendar, we admire the freshness of it for this time of the year, the clover helping the couch grass in this respect. Here, too, a pretty effect is given by the field Daisies sprinkled about. Among the Palms which grace this lawn are Phœnix Dactylifera (Date Palm), and P. Cycadeafolia, Corypha Australis (cabbage tree), Latania Borbónica, and Phœnix Reclinata, with two good specimens of Pritchardia Filamentosa flanking each side of the porch to the house.

Passing across the lawn to the left side of the picture we get amongst the forest trees, Ficus Australis, Pinus Halepensis, Cedrus Deodora, and C. Atlantica, and everlasting Peppers, which commemorate the taste of Lord Kintore, who had a weakness for them. Moving along to the west of the house a variety of border shrubs and annuals are set out, shading two or three large beds of Marguerite Carnations, Pelargoniums, and Mesembrianthemums, which should look very gay later on. Hiding the drive to the stables is a splendidly-grown box thorn hedge, which would bear a little trimming. Passing around to the back of the house we cross a natural grass patch with a number of Acacias, including a representative of the old-time Kangaroo.

We now come upon a rectangular shade-house containing a goodly number of Dracaenas, two or three good specimens of Scotopendriums (bird's nest fern), Azaleas, Aspidistras, Aspidium, Sabal Blackburniana, and S. Adansoni, Begonias, Kentias, Aspleniums, Platylomas, and a good variety of others. Leaving this we take the approach to the kitchen garden, which contains a splendid variety of table comestibles, all looking really well in various stages of maturity. Hereabout we notice climbers on the northern walls, particularly Bongainvilleas of Spectabilis, Splendens, Magnifica, Refulgens, and Brasiliensis varieties. Moving along to the eastern side of the house the trees and shrubs claim attention, and amongst them we notice the Quondong (native peach), Callistemon (bottle brush), Swainsonas, and others. Bearing away south across another spacious couch lawn we pass the long trellis of vines of a dozen varieties.

In the south-east corner is the richest sight of blooms yet presented. Here the gardener has spent some time in making a show of annuals. Ranunculus, Linum, Acroclinium, Stock, Autirrhinum, Spiraeas, Centaurea, Eschscholtzia, Saponaria, Nicotiana, with others make up a refreshing sight that one is loth to leave. Taking the path along the southern boundary we pass by the only fountain on the grounds, and a miserable looking thing it is for such a place, but a number of water plants are there to relieve the structure from absolute disgrace.

An orange and lemon grove is the last thing of interest to note before we arrive at the entrance gates again and take our leave of Government House.

The reader of this article may naturally ask if there are no Roses there. The queen of flowers surely should be grown at this place if anywhere. A few stray representatives are all, and these have to be looked for. The explanation of their absence is the limestone under the surface. The depth of soil varies from one to two feet, and this accounts for a good deal. Evaporation by surface heat and limestone substratum drainage will weaken the heart of any gardener.

Answers to Correspondence.

Aphis.—Can you please give a good remedy for aphis on roses?—Take a gallon of water. Boil it, and put a couple of ounces of dark tobacco into it. When cold, spray the plants. Soapsuds are useful, but not so effective as the tobacco solution.

Avenel, Medindie.—Is it a good practice to water peach trees when coming into bloom?—No. The watering will give them a sudden vigour, which is liable to check off just as suddenly, and the blooms will then probably drop off. Unaided natural conditions are the steadiest and best during the period of blooming.

Rosarian.—When is the proper time for budding roses?—Now. A good description of the process is given in "Gardening Operations for October."

Wager.—The correct pronunciation is Pitto-sporum. The word comes from pitte (to tar or pitch) and sporos (seed); the seeds being covered with a resinous pulp.

J. P., Mount Barker. — Gilliflower, Gilloflower, or Gillyflower, is a name corrupted from the French Giroflee, and applied to the common Wallflower (Cheiranthus Cheiri) in England. Cheiranthus is derived fram cheir (the hand) and anthos (a flower), from the custom of carrying Wallflowers in the hand as a nosegay. Gillovors and Gilloflowers are also names used by the old authorities, Parkinson, Gerarde, and Tusser, in descriptions of Carnations and Stocks. Shakspeare speaks of streaked Gillovors, meaning Pinks; and Sir W. J. Hooker's "British Flora" gives clove-pink Carnation, or clove Gillyflower, as "the curious choice clove July flower." Gillyflower may be a corruption of July flower.

Orchid, Tasmania, asks for some practical hints upon Orchid growing. We shall be shortly publishing articles upon this most interesting class of plants. In the meantime consult a nurseryman.

Geelong.—See article in "The Australian Gardener" for September upon Daffodils.

Manly, N.S.W. — 1. Carnations do better at the seaside than anywhere else. 2. No, certainly not.

Codlin Moth.—See last month's issue of "The Australian Gardener" article on Bordeaux mixture.

Climber.—Will you kindly name a variety of good climbers for fences, shade-house, and walls?—Bougainvillea, 7 varieties; Boussingaultia, 2 varieties; Ampelopsis, several varieties; Bignonia, several varieties; Clematis, several varieties; Dolichos, 2 varieties; Hardenbergia, 2 varieties; Jasmine, several varieties; Kennedya, 4 varieties; Tecomas, several varieties; Ipomœa (Convolvulus), varieties; Passiflora (Passion Flower), varieties; Roses, varieties; Tacsonia, varieties; Mediola Asparagoides (Bridal creeper); and a large number of others.

Letters From the States.

New South Wales Notes.

[From our own Correspondent.]

Sydney, September, 1902.

The display of flowers at the monthly meeting of the Horticultural Society of New South Wales held in Sydney last month consisted principally of Daffodils and Pansies. Of the former, those exhibited by Messrs. Yates & Co., of Exeter (Moss Vale), were remarkably good, the blooms being large, fine, and clean. The flower that attracted everyone's attention was "C. W. Cowan," a specimen of which it was unanimously decided to be one of the most perfect flowers one could wish to see. In fact it was the best flower in the room. Other excellent specimens of Daffodils shown comprised Sir Watkin, Emperor, Empress, and Portia.

The non-competitive exhibit of Mr. H. H. B. Bradley of twelve varieties of leading sorts in sets of seven and eight each, with own foliage, formed a very handsome exhibit, and was much admired. This exhibit was very highly commended, as was also that of Messrs. Yates & Co.

Another section that received notice was the miscellaneous collection of cut blooms, four exhibits of twelve.

In regard to Pansies, the exhibits, in my opinion, were not, collectively, as good as one would expect. The blooms shown by Mr. R. Davidson and Mr. J. Horton were, however, the exceptions. The former's exhibit of twelve sorts was very good, and that of the latter was only just a little inferior. The Pansies of these exhibitors were well shaped and prettily tinted.

The Walker Hospital, Parramatta River, showed a fine specimen of Lily of the Valley. Prior to this I was of the opinion that this flower could not be cultivated with any reasonable degree of success in the vicinity of Sydney; but it was only another proof of what can be done in floriculture provided plants receive the requisite attention.

The following is a list of prize-winners:—

Twelve Narcissi—Yates & Co., 1; H. H. B. Bradley, 2; H. Selkirk, 3.

Twelve Miscellaneous—Mrs. W. Sayers, 1; A. Tymms, 2; J. Horton, 3.

Twelve Pansies—R. Davidson, 1; J. Horton, 2; C. Gosper, 3.

Six Narcissi—R. Harper, 1; B. Haigh, 2; Mrs. Drummond, 3.

Six Miscellaneous—Mrs. Marks, 1; Mrs. Drummond, 2.

Six Pansies—Mrs. Marks, 1; R. Harper, 2; Mrs. Drummond, 3.

Bowl of Narcissus (any foliage)—Mrs. Horton, 1; Mrs. Drummond, 2; Mrs. Jones, 3.

Pot Plant in Flower—J. Yorke, 1; A. Tymms, 2; R. C. Cummings, 3.

Of recent years a practice that is finding much favour with several of our leading gardeners who possess lawns is the planting of clumps of Sparaxis and Freezias, &c., in the grass. The plants thrive exceedingly well, and the effect produced is very beautiful.

Owing to the scarcity of rain during the winter the outlook was not very bright for the success of gardens during the ensuing season, but thanks to the recent showers our gardeners have brightened up, and consequently buckled to with greater zest.

Victoria.

[From our own Correspondent.]

Melbourne, September.

The event of the month in Melbourne was the Royal Agricultural Society's Daffodil Show. Beautiful as the harbinger of Spring the Daffodil may be, it would be a monotonous display without the variety lent by flowers of equal beauty in their own spheres of art display. Hence it is that the Show is made up of flowers in season, and as such was a rich display of beauty. The Azaleas, Cinerarias, and Cyclamens were a charm of colour, and the surrounding Palms and ornamental foliage plants created a paradise of beauty which as a display in Nature's handiwork of art defies any attempt at description.

But the Daffodils were given pride of place, and without elaborating upon any special features of the exhibits we quote the report of the champion prizes from the Argus. The writer of this expresses the opinion that it was the best spring display yet seen in Melbourne, and we are inclined to agree with him. Speaking more particularly he goes on to say that Mr. Leonard Buckland, of Camperdown, an amateur enthusiast, who has year by year become more prominent with his exhibits, has this time reached the height of his ambition by simply sweeping away the first prizes in both the open and amateur classes. Such a perfect lot of Daffodils has never before been seen in Melbourne—all luxurious and robust, and with a perfect glow in the varying colours, that can only have been achieved by endless attention and intelligence, coupled with a great love for the flower itself, as well as appreciation of the honours of competition. Mr. Buckland won for the third time the amateur champion cup, presented by several leading members of the Society, and the Challenge Daffodil Vase, presented by Dr. and Mrs. Garnet Soilleaux, for a collection of 24 blooms, and both these trophies now become his property.

The champion prize for a collection was another feather in his cap, and he won Mr. James Long's special for the best single long trumpet, with a glorious specimen of King Alfred, and Mr. William Anderson's special for a medium trumpet bloom, with a beautifully delicate Poeticus Almira To go in detail through Mr. Buckland's collection would be but the repetition of the same note of warmest praise. There was hardly a weak bloom amongst the lot, but those likely to catch the eye, both of the specialist and the ordinary lover of beauty, are Maximus, King Alfred, Empress (really magnificent), Mimie Hume, Madeline de Graaf, Praecox Grandiflora, Innocence, Dr. Fell, and Poeticus Almira, the last the finest specimen of the Poeticus Narcissi ever seen in this Show.

Mr. Paton, Mr. Boyce, and Mr. Arthur Yates, of Sydney, had all good collections, and prominent, in a small collection sent for exhibition by Mr. Walter Clarke, of Glenara, were Plenipo, Brunett Poe, Flambeau, and Golden Spur.

South Australia.

[From our own Correspondent.]

Adelaide, September.

The month of September being the first of our spring months, when many of our gardens were expected to show signs of their coming glory from the comparative dulness of autumn, one might fairly have expected to see more than the gardeners presented, beautiful as they are.

It was during this month, too, that our two Shows were to present the florists' beauties in their most radiant perfection. We were not disappointed in the Shows, but regarding the cottage and more pretentious gardens, especially in the suburbs, they were not looking so gay as they should. Almost every gardener joins in the ready excuse that the season is at fault, and one or two of them appear to be quite puzzled about it. Seasons have a way of varying their temperatures just enough to upset the calculations of even the best of our gardeners. One remarked the other day, while smarting under some disappointment about his blooms, that no man can be a gardener and a Christian at the same time. This gentleman was evidently a true lineal descendant of that bad old Adam, who, it would seem, suffered in like manner to our friend. Adam evidently recognised the fact that no man could be a gardener and retain all the true instinct and virtures of heaven-born goodness as revealed later in modern Christianity. Be all this as it may, we sympathise with our mutual friend in his disappointments. And, notwithstanding that the September gardens in and about Adelaide (one expects to see so much because of their reputation) were not so gay as they might have been, yet there was much beauty to be seen as evidence of faithful and happy work.

Speaking personally I have visited very many gardens both from the inside and also from the outside of the front fence, and I must say the peculiarity about our cottage gardeners is their marvellous versatility of style and taste. One may travel for miles and miles around the City of Adelaide and nowhere will be seen two styles and tastes alike. Nay, indeed, will they be in any degree whatever alike. Certainly this marked variation has its pleasing aspects, but when one considers the extent of it there is a good deal to wonder at, particularly where conditions of opportunity, time, situation, and environment generally vary so little within given areas. For instance, one may walk along a terrace of suburban houses, or a whole street length, and in no two gardens will the observer notice anything like the same style of plan. Every plan possible and no plan at all are all represented there. Almost every flower may have its representative, but hardly any will be seen under similar conditions. Some early, some late, some spread in confusion here and dotted indiscriminately there, and so on indefinitely. Fault must not be found with all this, it is hardly worth while, but the peculiarity is very striking.

The Daffodil Show in the Town Hall was the first of its kind held in Adelaide, and as a show was very good, but the display of Melbourne growers not for competition must have convinced Adelaide people that they have a good deal yet to learn in the matter of arrangement in exhibiting. There is little doubt but that the climate over the Border is more congenial to the perfection of the popular blooms, if we except Mount Gambier, from where we should be glad to see some exhibits in next year's Show. Possibly the unusual dryness of the season was against the exhibitors, and perhaps with a better season and a little more experience the Adelaide gardeners will do better next year. The principal prize-takers were Messrs. C. F. Newman & Son, Mr. J. J. Gabb, Mrs. Laurence, Mr. W. Hackett, Mr. T. W. Babbage, Mr. E. Gries, Mr. W Rodgers, and Mr. H. J. Pearce.

The display of Cyclamens from the garden of Mr. George Laughton was a marvel of beauty, and the exhibit of Hyacinths by Mr. W. Hackett was such that is rarely seen at any Show. The spikes of bloom were perfect.

The exhibition included a show of Pansies, Camellias, Carnations, and Violets, all of excellent merit.

The Royal Agricultural Society's Show later in the month was one of the best in flowers that I have seen, and the large Exhibition Hall was certainly more tastefully arranged for the display than on any previous occasion. The Roses for this season of the year were good, and in every other department there was marked evidence of general improvement. The Camellia cut flowers were suberp.

Labels for Plants and Trees.

The best labels are those made of iron with the names cast in the surface. There are concerns which make such labels. These, however, are expensive, and cannot always be used. For home-made labels, I have never found anything better for shrubs and low plants than stakes which are neatly lettered with lamp black and oil. Stakes may be treated so that they will last a number of years. The zinc label, painted with lamp black and oil, makes a very excellent tree label, and will last several years. Some of the very fancy glass and porcelain labels are, of course, excellent when one can afford them.

Gardening Operations for October.

THERE is always such a lot to do in a garden. Of course there is. That is what it is meant for. Ask Adam, he began it. If there is plenty of work one always has the supreme satisfaction of knowing that there is plenty to show for it. Equally, on the other hand, the less one does, the less there is to show for it, except in the matter of weeds. Even the weeds exercise the privilege of grumbling, as the following little humorous refrain will show :—

THE WEED'S COMPLAINT.

"It's rough,
I tell you what, an' tough. Five times
I've taken root, this spring, an' tried to grow,
But ev'ry time I git a start, along
That smarty comes a-brandishin' his hoe—
An' chop! An' there I am again. They might,
I think, at least jest let a feller be,
Who wasn't doin' nothin', but they seem
To have a spite agin me, I can see,
An' I don't git no chance," said the weed.

"O' course,
If I was both'rin' anybody—but I ain't;
Ain't bonin' favors an' ain't makin' any blow.
I'm peaceable an' quiet an' jest try
To git along the best I know;
I wasn't even planted, but jest growed
All by my lonely—wasn't helped a speck,
As others are; but the less I ask,
It seems, the more I get it in the neck—
An' I don't git no chance," said the weed.

An' then,
Jest see that dude, the corn-stalk. Coddled till
It makes one tired to see. Why, do know,
He'd die if he'd not babied so! Gee-whiz!
If I but had that show—or half the show
That he has! Wouldn't I grow? I guess yes—
I'd top the fence in no time. Spread? Oh, my
An' smile? I'd pay for care, I would, a' be
The pride o' this whole garden 'fore I die—
But I don't git no chance," said the weed.

—*Cleveland Leader.*

Although cleanliness is one of the first considerations in a well-appointed garden, the flowers themselves require constant attention to keep them and their surroundings presentable. But such attention should not be classed as work. It is merely recreation and pleasure.

During this month the foliage of bulbs will begin to die off. As soon as the flowers are gone a jaunt round the borders with some string to tie up the straggling green leaves is well worth doing to keep them trim and give the young plants coming on a fair show of air and sunlight. When the tops begin to wither and turn yellow cut them off by degrees. Do not shave them to the ground right away or the flowers may be found wanting next year no matter whether the bulbs be left in the ground or removed to their sand beds until the time for replanting later on. We advise leaving the bulbs in the ground for three or four years without moving. Some specialists in Daffodils advise lifting every second year. The advice may be good, but something depends upon the suitableness of their beds. If the bed is found satisfactory we say leave them, the next remove may not be so satisfactory.

When walking round the garden admiring its beauties, nip off the dead flowers, the operation helps to keep the plants sightly, and the period of flowering will be lengthened.

This is the beginning of dry months, and a word or two about watering may be timely before the hoses and watercans are brought to bear upon the open beds. In the first place see that the driest spots about the garden are covered with a light mulch of some sort. Stable litter is good stuff, and so is seaweed. The prevention of evaporation by the heat of the sun and drying winds is the idea. A good soaking of water twice a week is all that is required, and once extra if the atmospheric conditions are exceptionally drying. Sprinkling the ground merely every evening or morning is a little better than nothing at all, in fact frequently does more harm than good. The water thus applied merely damps the surface, and the roots of the plants in their thirstiness grow up towards the surface instead of down into the nurture of the ground. The surface watering evaporates rapidly, the ground dries quickly, the roots become paralysed, and the plant wilts. Sprinklers are a great invention. They save an immense amount of labour, and give a good gradual soaking to the ground and at the same time cleanse the plants of foreign matter.

This is the month for Roses. The digging fork is a handy thing about the rose-beds at this time, but care should be taken when stirring the soil not to disturb the roots. A little liquid manure two or three times during this month will help the buds and the blooms. Aphis are great lovers of the Queen of Flowers, but their love is too exacting, and if allowed to continue will destroy the blooms. The plants will appreciate a spraying with soapy water carrying a tincture of tobacco.

BUDDING ROSES.

The operation of budding Roses is not carried on to the extent it might be with advantage. We offer the following explanation of the process from *Amateur Gardening*, which we think is as clear as one can possibly give it :—

"This is a very simple operation, and easily learned by watching an ordinary practical gardener. If anyone wishes to do their own budding I would advise them to ask someone to give them a lesson ,but not be satisfied in seeing it done, but put one or two in themselves in the presence of the instructor. They would learn more in five minutes' practice than in several hours study of books. Although it is necessary to know the theory, or the whys and the wherefores —which it is just possible that some experts cannot give who may be able to bud successfully— it is always better to combine practice with theory.

CHOOSING THE BUDS

is one of the most important parts of the operation. These must always be taken from flowering shoots. It is very tempting to take one of those strong young shoots which are thrown up from the bottom, as buds always look plump and good on them, and there is no flower to sacrifice; but the chances are that the roses grown from them would not flower so freely, if at all.

THE BEST BUDS

are generally about the size of small pin-heads, and very often the leaves have to be pulled back a little before they can be seen. When the right kind of buds are found the shoots must be cut off as low down as there are buds fit for budding. As each shoot is cut off remove all the leaves to within three-quarters of an inch of the shoot, and add the name. Cutting the leaves off at once prevents the shoots shrivelling, as moisture is evaporated through the leaves. Having selected the buds,

PREPARE THE STOCKS

to receive them. These may be briar seedlings, brair cuttings, standard briars, or Manetta cuttings. The standard is the most popular with amateurs, and the easiest for a novice to begin with. The young shoots on the standards should have grown rather long and fairly strong, and they are generally well matured by the time budding should be done. If the shoots are too young the first wind will cause them to break off where the cross-cut is made. First remove all the thorns and leaves on the two inches nearest the stem, and

MAKE A CUT THROUGH THE BARK

one and a-half inches from the stem upward, at the end of which make a cut across like a capital **T**, going about half-way round the shoot. But before lifting the bark

GET THE BUD READY FOR INSERTION.

This is done by starting to cut an inch above a bud and cutting half-way through the shoot, going straight down past the bud and coming out an inch below it. Now pull the wood out from the bark, which should come away quite easily if the shoot has been properly selected. Nearly everything depends upon how this wood comes out. If the shoot is too matured the bark sticks to the wood; this very often happens when the bloom has been cut off a few days previously, and there being no attraction the sap has ceased flowing. The wood should come out clean and have the sap shining upon it. Perhaps the most important point is how the bud breaks off from the wood. If it comes away leaving a hole leading up to the bud it will not grow. It often does this when the bud is too forward, but it hardly ever comes out when the bud is as small as a pin's head. There may be a slight indenture, but there should be no more. Growth takes place when the operation is done, while the sap is flowing freely in both, the cambium layers coming in contact with each other. But if there be a hole underneath there is no chance of the sap reaching the bud until fresh cells have been formed in the hole, which are gradually built up one above the other from the surface of the wood This would take several days to accomplish, and the probability is that by that time the bud would be dead. As soon as the bud is ready

LIFT UP THE BARK each side of the cut and push the bud in. If any part comes up above the cross cut let it be cut off level to it; then bind it in with matting. Everything should be ready so that the sap on either the stock or the bark of the bud does not get dry; if it does the bud will not grow, as the cells get clogged, so that the sap cannot pass through them.

LUPINS.

Some time ago we recommended Lupins as amongst some of the best of decorative border plants. The common field variety appears to be the only one known to gardeners in Australia. That assertion is perhaps a little too sweeping; but the thought arises from the fact that the best varieties are never seen in the suburban gardens. We recommended the beautiful yellow Menziesii, the white Termis, the rose Mutabilis, and the violet and rose Elegans. We give an illustration, sent to us from an unknown source, and we think our readers will agree that it is a plant worth cultivating. The name is derived from lupus, a wolf, owing to its predatory habits.

Lupins.

Lupins belong to the Pea family, and in the South of Europe the common white annual variety is ploughed in for the sake of the nitrogen-separating tubercles found in its roots. On the Roman stage the seeds were used as representing money, hence Horace used the expression "quid distent aera lupinus," "the difference between coins and counters."

The flowers are blue, pink, yellow, white, as noted in the seed catalogues. Hybridus-atro-coccineus is crimson, tipped with white. Cruikshankii (or mutabilis versicolor) comes from Peru; its flowers are blue, white, and pink.

Of the perennial varieties polyphyllus has bluish-purple flowers; nootkatansis, blue, purple, white, and yellow; and arboreus, from California, yellow. This variety grows several feet high, lives for four or five years, and grows a pithy trunk as thick as a man's arm.

DAHLIAS.

The absorbing passion that caught hold of gardeners some time ago for growing this delightful plant seems to have abated somewhat. The introduction of the Cactus varieties created quite a spell of enthusiasm; but gardeners on the plains found that the favourable climatic conditions of more elevated regions were wanting, and hence the hills growers now have a comparative monopoly of this beauty. They are, however, still very strongly favoured, and growers have their Dahlia beds already prepared, with the corms set out. But it is not too late. The tubers that have been stored and are showing shoots as an infallible sign that they require to be put into their beds should be attended to. They may be cut up like potatoes. If left till the shoots are three or four inches long they may be taken off and placed in pots and struck in heat. Single Dahlias may be easily raised from seed sown in Spring and planted out when the frosts are gone, which will be during this month. Dahlias are gross feeders and great drinkers. The ground should be made very rich by adding plenty of well rotted stable manure, and abundantly watered during the summer months. As soon as the shoots begin to attain a height by which they may be affected by the wind, they should be carefully staked, as they are very brittle, and apt to get broken. A light mulch of strawy manure will materially help the plants in keeping the ground moist. The application of liquid manure should be delayed until the plants are well forward, and then it will be found invaluable, particularly when the buds begin to show. The list of varieties has grown to a great length in the show, pompom, cactus, dwarf, and tree sections, and almost any seedsman's catalogue will gratify the most exacting choice. We must say, however, that no garden of any pretensions is complete without the variety known as Tree Dahlias. We know of nothing more beautiful than a cluster of these. They grow to a height of about 15 feet, with a great profusion of bloom. The white tinged with rose colored Imperialis is beautiful, and Maximiliana (mauve colour) is a delightful specimen of beauty when in full bloom in early autumn.

CUTTINGS.

Early in this month borders should be prepared for propagating cuttings, and a great deal of work is done for pot plants. One type of cutting will not suit all plants. The simplest form of cutting is that of those soft-wooded or fleshy-stemmed plants that throw out roots anywhere along their surfaces. The Coleus is a familiar type, cuttings of which will root if made by cutting through the stem at any point. The majority of cuttings, however, have to be cut off just below a joint, in order to get them to root freely. If cut off midway between two joints the chances are the cutting would rot, or at least be much longer rooting. The reason is that the wood cells are closer together at the joints, causing the stem at that point to be firmer and more capable of forming that collection of cells which we call a callus, and from which roots ultimately spring.

Some plants go yet a step further, and the young shoots of the current growth seem incapable of forming roots, and in order to get the cuttings of such to root successfully it is necessary to secure with each a portion of two-year-old wood. This portion constitutes the "heel," or the "piece of old wood attached." There are several ways of securing this, according to the growth or habit of the plant. In many cases the shoots can be broken out of their sockets, or cut off close up to the stem, which is a type of cutting suited to many shrubby plants. Another method of getting cuttings with a heel, and which is applicable to many plants which are cut down in Spring in order to get a crop of young shoots wherewith to form cuttings, is to press them downwards and tear from the plant, the skinny ends being clipped or cut off.

Yet another method is where the young current shoot is cut out of the branch as in the case of a rose or other bud for budding. Sometimes the branch may be cut into sections, cutting close under the joints, and having two young shoots, one on either side, to each. Split the branch down the centre, and two cuttings are ready for insertion, merely removing a few of the lowest leaves. The popular Genista or Cytisus should be treated as per these latter suggestions.

As a general rule, all leaves at the bottom of cuttings should be removed, as they prevent firm pressing of the soil, and generally soon decay, and are then a source of danger from that cause.

Fuchsias, Geraniums, Pelargoniums, Antirrhinums, Petunias, Verbenas, and such like plants, should be dealt with before the Spring is gone.

ANNUALS, BIENNIALS, AND PERENNIALS.

A number of half-hardy seeds may be sown this month for summer and early autumn flowering :—

Amaranthus
Aster
Balsam
Celosia
Cosmea
Cosmiduum
Digitalis (Foxglove)
Gomphrena
Helianthus (Sunflower)
Lobelia
Nasturtium
Petunia
Portulaca
Pyrethrum
Rudbeckia
Salpiglossis
Tagetes (Marigold)
Zinnia.

For general information upon the above, see the July number of "The Australian Gardener," and for soil and method of planting see the September issue.

The Pansy.

Its Cultivation.

[By R. Blee.]

IT is very seldom that I meet a person who does not like the Pansy. It is just as easy to grow a good bloom as a bad one. Pansies are so easy to grow from seed that any person with a small plot of ground can have abundance of flowers for several months in the year. The most that is required is to give them plenty of water during dry weather and a good mulch of manure, keeping the dead flowers picked off, and as they begin to get shabby cut back, when another flowering will result. Although I make it appear such an easy matter to grow Pansies—and I admit any schoolboy can grow his Pansy plant—there is a wide difference in growing them simply as flowers and cultivation fit for exhibition. The standard rule of judging is not upheld with the Pansy as it should be at our Shows.

POSITION.

This should be in an open aspect, clear of trees, and for early flowering ground sloping north-east is best; for late flowering ground facing south with a breakwind to the north will do. But I find the Pansy comes on early north of Adelaide, as the subsoil is composed of limestone, inducing good drainage, which makes the ground warmer.

MAKING THE BEDS.

These should be about four feet wide. January is the most suitable time for making them.

SOIL.

Suppose there is not good soil to start with, take out to about 18 inches, not less than 15, loosen up the bottom, after which put in some ordinary rough loam and manure to the depth of 6 inches, filling the remaining foot with good loam, mixed with a third cow or horse manure of equal parts, to be well rotted; the whole to be turned over several times before planting, without mixing the bottom six inches.

PROPAGATION.

There are two ways of doing this. One by sowing seed, the other by cutting. The first should be put in about the middle of February, and fortnightly sowing up to the end of March, or even later. Shallow boxes, 5 inches deep, are suitable, and I find a galvanized iron case answers well for this. Fill in with sandy loam up to 1 inch of top, the whole, when pressed down, well watered. Sow seeds half an inch or more apart. If they are sown too thickly they will most likely damp off. Cover over to the depth of an eighth of an inch, moisten, then put in shady place. Cover with glass slightly darkened, and in from ten to fourteen days the plantlets will appear. Then gradually remove the glass. Do not keep them too wet. In about five weeks the plants will be ready to handle, when they may be pricked off three or four inches apart into shallow cases, using soil much heavier than for seeds, and keep from strong sunshine. For cutting, young off-shoots are most suitable when they are about two or three inches long, with the heel attached, which does not require trimming, putting them into very sandy soil, pressing about bottom of cutting firmly. Keep in shady place. The best time to strike the cuttings is from March to November. Do not let them want for water or flower too much if cuttings are wanted for March.

PLANTING OUT.

As a rule I do the first planting from the 5th of May to the 25th. The rows should be about 9 inches apart each way. After planting give a good watering, and keep free from weeds. This can be done by constantly moving the soil in dry weather, which I consider is one of the most important parts in the cultivation of plants. It tends to keep the ground cool in summer and warmer in winter, besides clearing the land of weeds. Too many shoots should not be allowed to grow on a plant; five is plenty. Keep the plants from flowering till within a fortnight of a Show taking place.

WATERING, MANURING, AND SHADING.

When the warm weather comes on a good watering twice a week is beneficial, with syringing overhead after sunset until the flower begins to expand which are intended for exhibition. Give about the same time a good mulch of rotted horse manure. Stimulants can also be applied in liquid form of cow manure, which is the safest to use. Make it like weak coffee, applying once or twice a week. Other manures can be used, but I find this is the best. Shading is sometimes wanted to make the flower come to time. This can be done by partially covering the plant with pieces of cardboard so as to prevent the sun striking down on the flower. It is also a good plan to put something under the plant to keep the flower clean.

DISEASES AND INSECT PESTS.

The Pansy is often attacked with mildew. The best remedy is dusting with sulphur before the dew is off the plants. Red spider and green fly get into the points of shoots and disfigure the buds. Spraying with kerosine emulsion will kill them before the plant comes into flower. Sparrows do a lot of damage to the young buds and shoots by eating them. Place cotton across the beds. This will sometimes stop them.

STAGING FOR EXHIBITION.

A good exhibitor will always stage his flowers or plants to the best advantage, knowing that good setting up is a point with judges. I think they look better in their own foliage than in the white collars now used. The box should be inclined a little, not flat. If collars are used, two inches for show, three inches for fancies, are plenty large enough.

POINTS.

I am inclined to believe some good will come if there were rules prepared for our Shows. It is often remarked, "What a beautiful flower," simply because it is large. This is a mistaken idea, as all points cover size in a Pansy, and in other florist flowers. I have heard many say that there is no difference between a show and a fancy Pansy, yet they will allow it in Pelargoniums, Dahlias, and others. There are three classes in Pansies. Show Pansies are white ground, yellow ground, and selfs. The selfs comprise dark, white, and yellow. These should have a dense blotch on the lower petals, either small or large, and just showing in the upper ones. It must be well defined, without runnings. In white or yellow ground the colour of belting must be the same as all the petals. This applies to the ground colour also. Fancy Pansies have a blotch nearly covering the lower petals and two upper ones. The selfs are same as the shows, except this difference. Then come white, yellow, and other bands on the lower petals, with blue, purple, ruby, plum, and various colours on the top petals, laced, and other sorts. The markings should be distinct. The flowers should be of a leather-like texture, circular in form, quite smooth, eye well defined, blotches to be dense and running, colours clear and regular, of a large size, not less than an inch and a half for shows and two inches for fancies. George Glenny says :—

1. It should be round, flat, and very smooth at edge, every notch or serrature or unevenness being a blemish.

2. The petals should be thick and of a rich velvety texture.

3. Whatever may be the colours, the ground colour of the three lower petals should be alike, whether it be white, yellow, straw-colour, plain, fringed, or blotched. There should not in these three petals be a shade of difference in principal colour.

4. Whatever may be the character of the

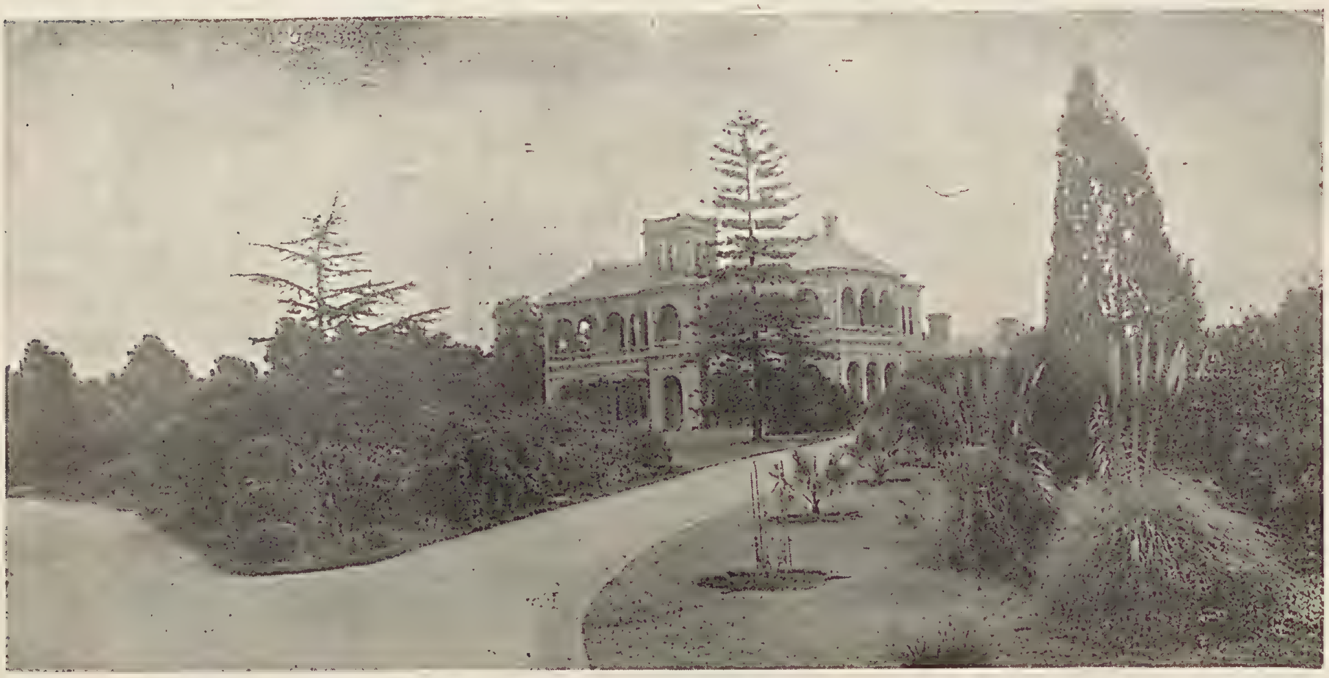
marks or darker pencillings on the ground colour, they should be bright, dense, distinct, and retain their character without running or flushing or mixing with the ground colour; and the white, yellow, or straw-colour should be pure.

5. The two upper petals should be perfectly uniform, whether dark or light, or fringed or blotched. The two petals immediately under them should be alike; and the lower petal, as before observed, must have the same ground colour and character as the two above it; and the pencilling or marking of the eye in the three lower petals must not break through to the edges.

6. In size there is a distinct point, when coarseness does not accompany it, in other words, if flowers are equal in other respects, the larger is the better, but no flower should be shown under one inch and a half across.

* * *

"THE BRIARS."

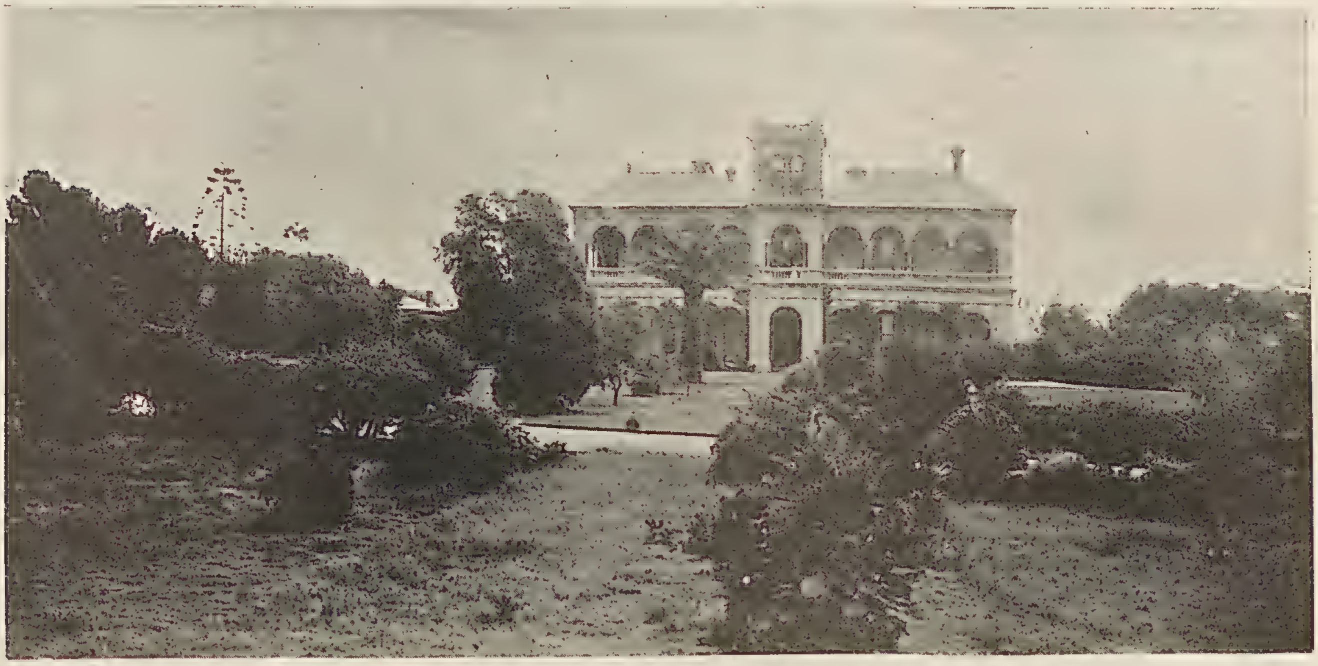


Residence of Mr. James Cowell.

DRIVING in at the entrance gates of "The Briars" the visitor enters upon fourteen acres of an estate almost upon the boundary of the City of Adelaide. Situated on the crest of a hill in the fashionable suburb of Medindie the tower of the house gives uninterrupted view of the city, suburbs, hills, seacoast, and northern flats, as far as the eye can reach, without exception the most charming panorama of scenery possible to imagine on a clear spring day. The variety and charm of the landscape beggars description, which neither pen, camera, nor brush can in any sense depict. To be in any degree appreciated it must be seen. No one could possibly appreciate it more thoroughly than the present owner, and his vanity on the point is quite pardonable. Mr. Cowell is nothing if not hospitable, possessing as he does that characteristic of the true type of the Australian, a true and hearty handgrip, a full wealth of greeting, warm and cordial, summed up in the refrain which he frequently repeats—"Glad to see you; make yourself at home." The pleasure of it all is that the visitor is impressed with the belief that he thoroughly means it, because if he did not he would not mind telling him so in a very few words. The partner of his joys and sorrows (if perchance such a thing as sorrow could possibly find a corner anywhere in such a delightful place), Mrs. Cowell is just like him in hospitality, only more so. Selfishness seems to have no place at "The Briars." Thousands of pot plants of one order alone go out of the glasshouses in the course of a year for bazaars for the poor, and to help the church, all on the quiet, the right hand not knowing what the left doeth. Occasionally the grounds are thrown completely open to some charitable fete, and that not merely of a parochial character. That famous institution in England, Dr. Barnardo's Homes, one year received a handsome cheque from Mr. Cowell in this way; and coming nearer home, for the sake of charity, he opened the grounds for the street boys of Adelaide, when the members and friends of the Adelaide University Shakspeare Society transformed a lovely little corner of the garden into a perfect ideal of the Forest of Arden wherein to play Shakspeare's pastoral drama, "As you like it." This was performed at "The Briars" in the open grounds for the first time in South Australia, and those present had never before seen anything so charming. Though a thorough Churchman, Mr. Cowell is thus seen to be no narrow-minded religionist. He says he is not rich, but wishes he were. Of this we know nothing, but he seems to make the most of what he has, whether much or little, for the benefit of those less fortunate. We are afraid to say any more of this happy couple, who, by the way, have a fine family of children, always to be seen deporting themselves as happy as only children can under such circumstances. Suffice it to say that in public spiritedness Mr. Cowell is a worthy successor to the former owner and builder of "The Briars," the late Hon. George C. Hawker, the mention of whose name gives those who had the honour of his acquaintance an instant inclination to raise the hat, for he was an English gentleman of noble birth and character. He was one of the fathers of South Australia, and the legislative halls of Adelaide reverberated some of the finest spells of oratory that have ever been heard there in the true interests of his country. Much as we should like to remind Australians of the debt they owe to such men as Mr. Hawker, our space must be devoted to a description, inadequate as it must necessarily be, of the grounds around whose seclusion he delighted to ramble during the quiet hours snatched from a busy public and private life.

Upon being introduced to the head gardener, who is new to "The Briars," our representative noticed at once that there was very much in the garden to be undone before he could make any headway in bringing the place up to what the present gardener intended it to be. It was quite evident that, true to his calling, as every successful gardener should be, he takes a personal pride in every flower, shrub, tree, and plant under his care.

Beginning at the entrance gate and looking up the drive shown in our first illustration leading up to the house we noted that the border on the left hand side had been all rooted up of its former sticks and wild grown products, only leaving those things of prospective value and growth. The edging of Fairy Miniature Roses was still retained. Behind these were a row of Marguerite Carnations, and select standard Roses, amongst which are noted Waban, Devoniensis, Perle de Jardines, Belle Siebrecht, The Bride, Le Sulphide, Sunset, Marquies Litto, and Kaiserin Augusta Victoria. Backing up these were Palms, Chamaerops Fortunei, Phœnix Reclinata, Pritchardia Filamentosa, and Phœnix Canariensis. In the vacant spaces were annuals and perenials in Chrysanthemums, Stocks, Pentstemons, Antirrhinums, and such like. While over against the neighbour's garden shadehouses along the line of fence, which looked somewhat unlovely at the time of our visit, the gardener had planted a select variety of Tecomas, Bougainvilleas, Rambler Roses, Solanums, and Ivy Geraniums, all of which in time will make a lovely background to the expansive border. Further along towards the grove of oranges and lemons in good bearing is seen a choice collection of shrubs, trees, and plants of smaller habit. Euphorbia, Abutilon, Camphora Officinalis, Clianthus puniceus, Pampas, Lavender, Buddleia, Fortunaea, Templetonia, Jacaranda, Polygala (now in profuse bloom), Genista Monosperma pendula (in full bloom), and other shrubs, including some select natives, which have been there for years, all looking well and giving an attractive variety when in bloom.



"The Briars."—Illustration II.

On the right hand of the drive to the intersection is a Buffalo lawn bordering, several feet in depth, relieved in the foreground by Palm centres at given distances apart. In each of these Palm plots are also sown separately Geraniums, Stocks, Verbenas, Nemophila, Lobelia, Helichrysum, and Pansies, and as the Palms are yet young the effect will no doubt be good in a few weeks hence. As a background to this border, and hiding the park and paddock beyond, is a medley of high forest trees, dense in the thickest of growth; several finely-grown Conifers, Carobs, and Eucalypts. A tropical aspect is lent to it by a number of Yuccas and Aloes. An Acacia full of its golden glory stands hard by a large bush of Laurustinus covered in its mantle of white. The general effect of this scene is a happy blending of the art of the gardener and of nature.

Now coming to the intersection of the drive and passing up towards the house by the roadway to the right we linger by the continuation of the broad border, and note the winter Stocks in profuse bloom, the Michaelmas Daisies, Ageratum, Veronica, Pinks, Statice, Heliotrope, and Roses filling up the spaces between the shrubs and trees, until we come to another orangery at the side of the house. Between the orangery and the house is a fence covered with Hardenbergia in beautiful bloom, Ivy Geranium, and a White Banksia Rose. Turning to the left immediately in front of the house is a very spacious Buffalo lawn, gracing which are a very finely-grown Cocoanut Palm, Jubaea Spectabilis, a Cordyline, and a Norfolk Island Pine.

Crossing the front lawn we come upon the rosery, which is a comparatively new addition to the garden, and carries a selection of about 150 varieties, all now showing their young bronzed and green foliage. Edging this favourite spot are rows of Carnations, Dianthus, Pansies, and Violets, with a clump of Gaillardias in their beautiful brilliant blooms. Traversing the path to the left leading on to the drive we note, still on our left, a small shrubbery of excellent value, containing some rare specimens of plants, trees, and shrubs, including Spirea, Polygala, Reevesiana, Statice, Diosma, Wigandia, Genista, Conifers, Acacia, Solanum, Flowering Peach, Jacaranda, Brugmansia, Cantua, Pittosporum Undulatum, and others. As edging to this Pyrethrum takes the outside, with Pansies, Dianthus, and Petunias inside.

Still walking away direct from the front of the house and crossing the drive we note alongside the orangery a choice bed of Roses on the left, while on the right Wigandias have taken complete possession of a considerable quantity of ground. Beyond these is a little stretch of open grassed land, with some finely-grown Pine trees, which must be of considerable age, judging by their height and general dimensions, Carobs, Wattles, and Palms. In the seclusion of this undisturbed bush-like scene Mr. Cowell makes special treasure of the blackbirds.

Now facing round towards the house we have the position taken by the photographer for the second picture, giving a front view of the house. The illustration speaks for itself. Immediately on the left corner of the house is a finely-grown Pepper tree, and standing by this looking into the dense foliage of the Pines is a lawn, horseshoe shaped, and completely embowered with a trellised Fortuniana on the left, with a background of Olives and Pines, while on the right is Mr. Cowell's favorite Ash tree, the bright vivid green of the new foliage giving a beautiful contrast to the more sombre hue of the surroundings. This is Mrs. Cowell's favourite corner of the grounds, and it is graced with a magnificently-grown Palm

Keeping to the path that leads away from the bowery and beyond the Pine trees, taking up the left foreground of the picture, the visitor lights upon the way to the grotto, This grotto was once the fame of "The Briars." When it is mentioned that it cost Mr. Hawker a sum well up to £1,000 for a specialist to build, the beauty of it can well be imagined even now in its present state. We are afraid to offer any remarks upon this beauty spot, further than to say that it is a pity that Mr. Cowell cannot be persuaded to forego his fixed determination not to allow an axe to be used in the garden under any circumstances. An axe is certainly a dangerous weapon in the hands of some gardeners, but we are quite convinced that if it were laid to the roots of the Peppers planted on the top of the grotto, and exotics put in their places, the effect would be decidedly appropriate and in keeping with the correct idea of this work of art as originally intended by the artistic architect of the structure. On the top of the grotto are a number of basins intended for water plants, all artistically arranged with the rockery, about which should be grown succulents such as Agaves, Aloes, Echinocactus, Euphorbia, Stapelia, Mammillaria, Phyllocactus, Mesembrianthemum, Bamboos, Grasses, and the like. Traversing the winding path to the grotto underneath one can fancy himself in a corner of the famous Jenolan Caves, for there are capital representations of stalactites and stalagmites, and ideal nooks and corners for Begonias, Ferns, Lycopols, Aspidistras, and such like, which would turn the place into a veritable fairy dell, at very little cost.

Leaving this charming little spot and crossing the lawn at the side of the Pine avenue on the left of the picture, but not shown, we come upon an octagonal palm-house containing some fine specimens of Palms, Elk horn and Tree ferns, Cannas, Camellias, Strelitzias, and others, with climbers of Asparagas, Clematis, Stephanotis, and a mass of beauty in Bougainvillea covering one side to the summit of the house on the outside.

We find that we have lingered too long already in the space at our disposal, and must omit the beauties to be found in the two fine glasshouses, if we may except one of the finest shows of Coleus to be found in a private collection. In the course of a few weeks the ferns and exotics here will make a splendid show. We would willingly stay a while here, but pass along through the gate leading to the kitchen garden. After a cursory glance through the propagating house, where a good variety of young stuff is coming on, our guide recapitulates his catalogue of comestibles in cucumbers, turnips, melons, carrots, lettuce, onions, parsnips, raddish, cress, cauliflower, and other toothsome vegetables, with herbs best known to the chef. Here also is an orchard of peaches, plums, apples, apricots, and so on. But we must say good-day to this magnificent estate, which is one of the finest and best appointed suburban residences in the State. As a parting admonition the gardener, whose hands are very full of work and responsibility, impressed upon us not to forget to mention every weed that grows, and about this he was quite emphatic

President Roosevelt has called the Pansy "the grandest flower I know."

SCIENTIFIC.

GREVILLEAS.

The Grevilleas are among the showiest of the Australian proteads, yet only a few species are known to be under cultivation out of more than 180 which are indigenous to Australia. With the exception of four New Caledonian species, the genus is limited to Australia. It is a lamentable pity that such an interesting genus of plants should be so neglected. Strange to say we cultivate numerous European and other plants which are really not suited to our climate, whereas the Grevilleas will exist and prosper with very little attention. During the summer months, when we have to water exotic plants, the Grevilleas rarely require any. When in a young state the Grevilleas can be kept in shape by pruning. Most of the varities like a sandy soil. The following is a list of some of the showiest, which are under cultivation in a few gardens :—

GREVILLEA STENOMERA is a spreading shrub of from 5 ft. to 6 ft., fairly compact. The young branches are hoary or silvery, with a minute tomentum. The adult foliage is more or less glabrous. The leaves are pinnate with narrow linear segments. Racemes of flowers are solitary or several in a terminal panicle. 2 in. to 3 in. long It is found in abundance around Bunbury, W.A.

GREVILLEA CONCINNA is another showy species, and a few years ago used to be offered by nurserymen. At present it is known in a few gardens by those who take an interest in Australian plants. It is a dwarf grower, not exceeding 3 or 4 ft. in height. The leaves are mostly entire, linear, or linear lanceolate, very shortly mucronate, 1 to 2½ in. long, smooth above, and glabrous when old. The racemes of flowers are terminal and mostly pedunculate, of a reddish colour, borne in great profusion. It is a native of Bremer Bay and other places in Western Australia.

GREVILLEA BANKSIA.—This is a another showy species. It grows to a height of from 15 to 20 ft. in suitable localities. The leaves are deeply pinnatifid or pinnate, with two to ten or more broadly linear or lanceolate segments, obtuse, or mucronate, with recurved margin, 2½ to 4 in. long. Racemes terminal, erect, 3 to 5 in. long, solitary, and sometimes two or three on a terminal leafless peduncule. The flowers are of a brilliant red, and during September it makes a gay show in a garden, or in its native habitat. In the Adelaide Botanic Gardens there is a nice specimen about 8 ft. in height. It is a native of Shoalwater Bay and other places in Queensland.

GREVILLEA LAURIFOLIA is also a nice species. It is frequently met with in the Blue Mountains (N.S.W.). Usually of a procumbent or trailing habit. The leaves are ovate, oblong, or broadly lanceolate, obtuse, or mucronate, 2 to 5 in. long, glabrous above, silky beneath, racemes usually terminal and 1½ to 2 in. long. Colour, red.

GREVILLEA ILICIFOLIA.—A large, spreading shrub, frequently attaining a height from 6 to 8 ft. The branches are more or less silky. Leaves in the typical form cuneate, undulate, prickly-toothed, and lobed at the end. The whole leaf is 1 to 2 in. long. Racemes of flowers terminal, 1 to 2 in. long, of a creamy white colour. It is a native of South Australia and Victoria.

GREVILLEA ACANTHIFOLIA is rather a straggling shrub, but can be trained into a nice bush by cutting back when young. The leaves are 3 to 4 in. long, deeply pinnatifid. Racemes of flowers terminal, of a pinkish colour. Native of Blue Mountains (N.S.W.)

GREVILLEA MUCRONULATA.—A large shrub 6 to 8 ft. in height, with rather slender hirsute branches. Leaves shortly petiolate, ovate in the typical form, and either rounded at the ends, with a fine point in the centre, flat, or with recurved margins, mostly about ½ in. long Racemes loose, short, few flowered on slender terminal, or axillary peduncles, often longer than the leaves. It is found growing from Port Jackson to the Blue Mountains.

GREVILLEA ERICIFOLIA.—This is another very charming low-growing shrub, and occasionally is to be seen in a few gardens. Although not so hardy as some of the species above mentioned, it is very suitable for the colder districts, where some of the hardiest kinds cannot be grown. The leaves are sessile, linear, or lanceolate, mucronate, acute, with resolute margins, ½ in. to 1 in. long. Silky pubescent, or villose, racemes of flowers short terminal, of a reddish colour. It commences to flower during the early portion of spring, when the plants are literally covered with blossoms. In general appearance it very much resembles some of the ericas in foliage, and hence its specific name Ericifolia. It is under cultivation in the Adelaide, Melbourne, and Sydney Botanic Gardens, also in several private gardens.

GREVILLEA LAVENDULACEA is a a well-known species, especially in South Australia, where it is to be seen growing profusely about the Mount Lofty Ranges. It is a small growing shrub, seldom exceeding 2 ft. in height. The racemes are short and loose. Solitary in the upper axils, very much crowded, of a pinkish red colour.

GREVILLEA ROBUSTA, or "Silky Oak," as it is generally called, is so well known all over Australia that it is hardly necessary to mention in this article. It makes a beautiful tree in suitable localities, attaining a height of 70 to 80 ft. It is a very rapid grower, and in Victoria, New South Wales, and Queensland it is planted very extensively. It is a native of the northern parts of New South Wales and Queensland.

GREVILLEA HILLIANA is a neat tree of middle size. It is to be found more or less plentiful about the Clarence River, New South Wales, and Moreton Bay, Queensland. It is one of the handsomest of the Grevilleas. The leaves are glossy and 5 to 6 in. long. The flowers are borne in dense, spike-like racemes, 4 to 8 in. long. Highly recommended as a garden shrub.

GREVILLEA JUNIPERINA is a very dense, compact grower, and in appearance very much resembles some of the European Junipers. A very nice specimen of this species can be seen in the Adelaide Botanic Gardens.

HOW PLANTS CLIMB.

Some plants climb simply by threading their way through their supports, the spreading growths that they afterwards make preventing them from slipping back. In the climbing Rose this is helped by the recurved prickles. In this connection the Elaeagnus deserves attention. At first the side shoots point upwards, then higher up they are at right angles with the stem, after that they point downwards so as to form a hook, which catches over any convenient support. But the curious thing to note is that in these hooks the inner angle is filled in to give the necessary strength, for it is well known to mechanicians that without such filling in the angle is extremely weak.

A second mode of climbing is by twining round the support when this is sufficiently fine. Each plant has a definite direction of twist, described as right-handed or left-handed, positive or negative, counter-clockwise or clockwise. The two first are ambiguous, the third is clumsy. Looking at a compass and starting from east, the two possible directions are towards the north or towards the south. Let us call the first EN-rotation, the second ES-rotation. The Hop, then, EN-rotates; the Scarlet Runner ES-rotates. The Hop is furnished with small anvil-shaped hairs which assist its grip; these are just visible without a lens. Another favorite method of climbing is by Tendrils; the advantage is that the stem can now grow straight up instead of having to lose time in twining, and the contraction of the tendril, after it has taken hold, helps to draw up the stem. Tendrils have different sources; in vines they are modified flower stalks, in Lathyrus an extension of the mid-rib of the leaf, and in Sarsaparilla they are readily seen to be altered stipules. The tendril of Bignonia Venusla ends in three sharp claws. The leaf-stalk of Lophospermum acts as a tendril by clasping the support. Some plants growing against a wall put out adhesive discs, as in the Virginian Creeper; and others aerial roots, as in the Ivy and Climbing Fig. When the Ivy gets beyond its support it flowers, and the leaves change from lobed-leaves to heart-shaped. The free tendril of a plant sweeps slowly round as if in search of a support, but for full information on this subject the reader is referred to Darwin's book, as no summary can do justice to his minute and carefully-conducted experiments.

REVIEWS.

KERNER'S "NATURAL HISTORY OF PLANTS," WITH BOTANICAL NOTES BY "S."

[We shall be pleased to review any books, magazines, or periodicals dealing with plants sent to us for that purpose.—ED.].

To prevent rain and dew stopping up these stomata many contrivances are found. Some leaves are furnished with a waxy coating which sheds the water: the upper surface of a cabbage leaf is a case in point. Others have a hairy or felted surface; others have little projections on the leaf surface, drops of dew rest on these, and bridge over the hollows where the stomata are placed, these, therefore, remain dry. Some leaves are rolled back so as to keep the water away from the stomata; others have ridges or embankments for the same purpose. That these contrivances do keep off the water is easily proved by immersing a leaf and noticing how dry that side of the leaf remains where the stomata are situated.

But whilst transpiration needs to be encouraged in the wet season, in the dry season excessive transpiration must be checked. This is mainly done by the guard-cells of the stomata: when the air is dry the inner concave edges of the guard-cells straighten and close the aperture. But the waxy secretion on many leaves, already referred to, the varnish, the limy and other salts and the hairs all help to ward off the direct action of the sun's rays, and restrict exhalation. In this connection Kerner gives wood-cuts of a number of characteristic hairs, woolly, jointed, silky, ribbon-like, spiral, star-shaped, umbrella-like, T-shaped, shield-shaped, &c., &c., and I would recommend any who has a low-power miscrscope or even a good single lens, to make a collection of leaves for the purpose of showing the very great variety of leaf-hairs.

Another method for the plant to avoid the extreme heat of the sun is to arrange its leaves north and south, so that the edges are presented to the noon-day sun. The Compass plant (Sylphium) does this, so that if you look at a number of plants in the N. and S. direction they appear as if flattened out artifically. One of the wild lettuces shows the same peculiarity.

Other plants, including various grasses, fold their leaves together as protection from the noon-day sun, or even to avoid sudden bursts of sunshine.

Still on the subject of leaves, Kerner next describes the various manners in which the young leaves are folded in the bud, and then proceeds to the fall of the leaf, showing that leaves do not fall merely because they are dead, but are thrown off by the formation of a "separation layer" at the base of the foot-stalk.

Then comes "Phyllotaxis," or the arrangement of leaves on the stem, generally in a spiral. If you pinch the tips off two leaves standing one above the other you will find that there is a definite number of leaves included in the set. Of course, only one of the marked leaves is counted in. These sets are one of the following series, 1, 2, 3, 5, 8, 13, &c., where each new number is the sum of the two previous ones. And to complete the set you have to go round the stem as many times as the first of these two previous numbers.

Thus, if there are five in a set you have to go round twice, if eight three times.

Five is common, and eight not infrequent, but for the higher number fir cones are most suitable.

Another interesting chapter is upon "Leaf Mosaics;" that is, the way in which leaves fit into one another when looked down upon. Of course, this fitting in is designed to give every leaf a fair share of light, and it is really marvellous to see how beautifully some leaves dovetail together.

Begonias, Campanulas, Climbing Fig, Nightshade, Elm, and Ivy may be taken as striking examples.

We have seen how plants protect themselves from heat and moisture, but how are they to keep off browsing animals.

First, by poisons, as in the case of the Deadly Nightshade; next by offensive odors, as in the Datura, common in the Torrens bed; thirdly by unpleasant tastes.

Then, again, water forms an excellent protection against grazing animals, who seem to avoid plants covered with dew or raindrops. A Lady's Mantle (Alchemilla), which is thus avoided, is eagerly taken as food when the water is shaken off.

But the chief protection against animals is furnished by spines and prickles, and these are frequently undeveloped above the line to which ruminants can reach. For examples, see the Wild Pear and the Holly. In many cases the leaves themselves are prickly, as in Thistles and Acanthus, Aloes and Agaves. Other leaves have saw-like edges; others, like Solanums, have prickles projecting above and below from the blade of the leaf. Some, too, like Nettles, have stinging hairs, which break off and leave their points in the flesh.

The Cactus-like plants have particularly unpleasant spines, and it may be found by experience that they penetrate the skin before the hand is thought to be near them. This arises from the extreme point being black, and, therefore, invisible. It is worth while comparing the points of some of these spines with that of a needle under the microscope. It will be seen, too, that such spines are often barbed.

LIGHT EMITTED BY PLANTS.—It is well known that certain mushrooms emit enough light to read by, and I am desirous of trying whether they would affect a photographic plate. Unless oxygen is present the light ceases, so that a chemical change is probably involved.

Although not really luminous, a tiny moss (Schistostega osmundacea) is popularly known as the "luminous moss." It grows in caves, and when the cave is looked into from the exterior through a narrow opening the floor sparkles with innumerable golden-green points of light. If, however, the earth is brought out into daylight the fairy gems have disappeared.

The explanation is this. From much branched threads, spread horizontally, arise numerous twigs bearing groups of spherical cells like grapes. These "grapes" are transparent, and reflect the light on to some chlorophyll granules at the back. The arrangement is exactly like a cat's eye on a small scale, and just as you see the cat's eye gleam most when your back is to the light, and the cat facing it, so these cells gleam best when the observer looks through the small opening which partially lights up the cave, turning his back, of course, to the source of light.

Climbing Plants have been exhaustively treated by Darwin, and in his book will be found ample information as to the slow rotary movement of the tip of the climber, as it seems to be searching around for a support.

It will be sufficient here to allude to the various methods of attachment of the climber. Some simply weave themselves in among other plants, and are helped by prickles sometimes recurved. Others twine round their support if this is sufficiently thin. Others, like the Lophospermum, hook on by sharply bending their leaf-stalks. The Elæagnus, after a certain height is obtained, puts out shoots directed downwards, and these act as crooks. Many plants climb by tendrils of various kinds, these tendrils being sometimes modified stems at other times modified leaf-stalks, stipules, and even roots. One of our garden Bignonias puts out a triple claw like a bird's foot, the Virginian Creeper an adhesive disc, and the Ivy an aerial root.

Propagation of Plants by Leaf Buds.—"The leaf of the Bryophyllum calicinum (one of the house leeks) exhibits in each notch of the margin a group of cells which is perceptible as a dot to the naked eye. So long as the leaf remains upon the stem there is usually no further development of these cell aggregates, but if the leaf is plucked off and laid on the earth an active process of division is set up in them, the result of which is the formation of a little plant with stem, leaves, and roots.

"This method of propagation by leaf cuttings has been particularly applied to Citron and Orange trees, to the Hoya, Aucuba, Clianthus puniceus, and to various other plants besides."

It is the method usually adopted to propagate Begonias and Gesneras, the leaf being pressed down on moist sand. Little cuts are generally first made through the leaf across the strands.

(To be Continued.)

Hints on Potting Plants.

The very important operation of repotting plants is very imperfectly understood, especially by amateurs, and as the time of year is now at hand when a considerable amount of this work is usually done, a few hints may be useful to many who have not had much experience thereof.

In the first place, the pots used should always be perfectly clean and dry inside, for if wet and dirty the roots are sure to cling tenaciously to the sides, and it will be found very difficult to turn them out for repotting without damaging a number of the best, and subsequently giving the plants a very severe check. When a flower pot is quite dry and clean inside it is a very easy matter to turn out the plant without damaging a single root. The next important point to be considered is the drainage, for the future welfare of a plant depends in a great measure on this being properly and thoroughly done. Broken pots, or as they are usually termed "crocks," are the best material to use for draining flower pots, and they should be clean. If not clean hey should be washed in a tub or pail with a broom, and then dried. The right depth of drainage to use must of course depend to a great extent on the size of the pot and the requirements of the plant, but as a general guide about two inches may be placed in an eight-inch pot, increasing or diminishing this quantity according to the size of the pot. When time can be spared it is better to place each piece of crock the hollow side downwards.

Another detail of very great importance is to see that the compost to be used is in the right condition as to moisture, and neither too wet nor too dry. To secure this desirable result, a store of such materials as loam, peat, leaf-mould, old mushroom bed manure, and sand must be kept in a dry shed or similar place out of the reach of rain and snow. Should any of the materials become too dry, this is easily remedied by adding sufficient water to moisten it before using. Unless the compost is in the right condition of moisture it cannot be pressed down or rammed firmly. When potting plants their nature and requirements must be taken into consideration. For instance, many green-house plants of the hard-wooded section, such as azaleas, heaths, and rhododendrons, that produce a profusion of hair-like roots, thrive best in a peaty compost of the hardest texture. In all cases however, of very firmly potted plants, it is essential to leave plenty of room for water, for the balls take it slowly, and require a large quantity to soak them thoroughly. Less than half an inch ought never to be left when using small pots, and with large ones soil should not come within two inches of the top of the pot.

Stove flowering plants of a woody nature, such as Bougainville, Allamandas, Ixoras, and many others of a like character, require very firm potting, so as to produce as much as possible a firm short-jointed growth. On the other hand, stove foliage plants, especially those for which peat is used, such as Alocasias, Marantas, Caladiums, and similar quick-growing, shade-loving plants make the finest leaves in an open fibry soil. Soft-wooded greenhouse plants, such as Fuchsias, Zonal Pelargoniums, Begonias, Calceolarias, and similar plants, although they like a moderately fine soil, should not be rammed too hard.

In shifting on plants to larger pots, and there is not room to use the fingers and thumbs for pressing down the soil, it is best to use a thin potting stick for working down the soil around the balls. When young plants are first potted into small pots they usually need a good watering to settle the soil, but in shifting established plants to larger pots it is not advisable to water for a day or two afterwards unless the weather should be very hot and dry, which often happens in summer.

Another important point is to see that the ball of the plant to be repotted is thoroughly moist before shifting to a larger pot. If a plant is repotted when in a dry condition it is almost impossible to properly moisten it afterwards. Newly potted plants, especially hardwooded, greenhouse subjects, require very great care in watering till the pots again become moderately filled with roots.—G.T.D. in *Amateur Gardening.*

Spiraea.

The Spiraea is known in England as the Meadow Sweet, and in France and Germany as the Queen of the Meadows, as its habitat is damp pastures. It belongs to the Rose family. The white flowered species are ulmaria (scented), Van Houttei, media, discolor, prunifolia, Lindeyana, japonica (many varieties), triolata, argula, hypericifolia. The rose flowered are tomentosa, fortunei, expansa, salicifolia; pachystachys, pink; semperflorens macrantha, rose pink; Douglasi, red; Bullata, rose; and decumbens, white; are suitable for rockeries. Others are mentioned in the nurserymen's catalogues, so that the choice is large. What is known as Spiraea grandiflora is properly Exochorda grandiflora, and is a lovely shrub, almost a tree; E. Alberta is said to be even more handsome.

Protea.

If one of the so-called flowers of the Protea be cut through lengthways it will be seen that the outside ornamental scale-like bracts enclose about 60 of the true flowers. These have each a long tubular perianth terminated by the silky hairs seen just inside the cone of pinkish scales. One side of this perianth bears three long anthers, the other an aborted one. The Protea mellifera comes from the Cape of Good Hope; the yellowish-white variety flowers earlier than the pink one, but is not so handsome.

THE ORCHARD.

Fruit Tree Green Pruning.

[By GEORGE QUINN, in the *Journal of Agriculture.*]

TO obtain the most uniform results it is necessary with many kinds of fruits to prune while the trees are in active vegetation.

Summer pruning is a misnomer, as the context will show. The work in its varied phases is performed from early spring until late summer, according to the kind of tree operated upon or the object sought.

The European term "green pruning" is far more accurate and expressive.

Peach Trees in Bloom.—School of Horticulture, Victoria.

To simplify matters I propose placing the various operations performed under this heading in the order in which they would most likely be applied to a fruit tree, beginning at the period of its transplantation into the orchard.

(1) Disbudding, to shape the tree, by selecting those shoots destined to form the main arms, and encouraging them by removing others which would check their progress.

(2) Pinching off the terminal points of shoots to temporarily check their extension.

(3) Disbudding to reduce the overcrowding of fruit-bearing wood.

(4) Shortening in wood which has been left to carry fruit, but which has failed to do so either wholly or in part.

(5) Fracturing, to induce the formation of of fruit-bearing spurs.

In the early manipulation of young trees, such as the apricot, the main branches of which are liable to split away from the trunk in later years, it is desirable, as far as practicable, to separate the points at which the main arms emerge from the trunk. This can frequently be done when a good number of buds start simultaneously from the trunk by simply rubbing out about every alternate one. Owing to the upper buds receiving most sap, they will almost invariably grow more rapidly than the lower ones, but this can be regulated by the adoption of the second practice in our synopsis, viz., pinching off the terminal sappy points of the dominant shoots from time to time.

In PLATE I. a young peach tree planted in the winter of 1897 is shown. Its first growth of shoots from the main stem—which was cut off about 20 in. from the ground on being set out—is seen in a natural condition.

PLATE II. shows the lower shoots removed and the upper ones retained. This could have been done by the winter pruning, but the amount of wood to be sacrificed would be greater, and the wounds made would heal less quickly.

On the same peach tree as it stood, about 5 ft. high, prior to the winter pruning in 1899—nearly two years later—the shoots not actually required for the formation of main arms were rubbed off absolutely. In comparatively cool districts and with some kinds of trees—such as peach and nectarine—this practice is safe. In places, however, where the sun shines very hotly in early spring, or upon trees with close, smooth bark, such as the cherry, apple, and plum, the method of retaining all the lower shoots is best. Restricting their extension from time to time by pinching off the sappy growing points is desirable and necessary to the proper development of the tree. These shortened growths assist in the vegetative functions of the tree, keep the bark free, and the sap active, as well as affording excellent shelter from the direct rays of the sun and the drying effects of warm winds.

In connection with pinching to apply a temporary check to any dominant branch, it must always be remembered that when a growing shoot is severed at a point where the growth is fibrous and fairly mature the wound will heal rapidly, and growth recommences in a very short time. So, to attain this object, the pruner must always be careful to remove only the brittle cellular growing point with thumb and finger.

The vigorous winter pruning usually found necessary to maintain a furnished condition upon peach, nectarine, apricot, etc., frequently causes a number of superfluous shoots to arise from the main limbs each spring. This is more noticeable, and requires more attention upon the two first named on account of their fruit shoots not being permanent spurs.

PLATE III. is a portion of a main limb cut from a similar but slightly older tree. In a length of about 18in. nine shoots have emerged. If these were permitted to remain they would become crowded, and, owing to shutting out the light, would grow drawn, long, and weakly. The lower buds would remain undeveloped, and the fruit buds for the next season would be formed on the extreme ends. Besides this the tendency would be for some to be choked out of existence by stronger adjacent growths. The neglect of disbudding at this stage is doubtless one of the main causes of the rapid dying out of laterals upon the lower limbs of peach trees here.

Plate I.—Young Peach Tree.
First Spring Growth after Planting.

In Plate IV. I have shown the same limb with all the shoots maked S suppressed, and at the later stage possibly one or two of those marked R would be removed. In examining similar shoots it will be noted that those set upon the upper surface of the parent branch usually exhibit a tendency to outstrip the growth of their fellows located upon the sides or underneath the parent branch. This shows the advisableness of retaining wherever possible the shoots with equal opportunities of obtaining nourishment and light.

Plate II.
Same Tree with Lower Shoots Removed

The peach and nectarine also require much attention in the direction of shortening back towards the parent branch wood which has been left for fruit production but has failed more or less to fulfil expectations.

On Plate V. two common instances are reproduced. Fig. 1 is about 15in. long. More than half of its length is wholly devoid of fruit and partly of twigs. There is nothing to be gained by such undue extension. It will be noticed that the 2 twigs marked 1 and 2 nearest to the base, and another marked D have no fruits near them. The other three, marked P, each have a fruit at its base. The old shoot should be shortened back to the growth emerging at the top P, and the barren shoot D should be rubbed off. This will usually cause base buds where the old shoot joins the parent branch, just below twig 1, to grow. If they do not grow the shoots marked 1 and 2 will be retained at the next winter pruning to continue to furnish fruit-bearing wood. The forcing of base buds into growth can be assisted by pinching the growing points out of the shoots retained upon Fig. 1 from time to time, as previously explained, but under the conditions prevailing in this State such repeated attentions are scarcely practicable where many trees are grown. Fig. 2 in same plate shows a shoot left for fruit-bearing, but it has failed to set any; consequently, to prevent crowding and much pruning next winter, such barren shoots—unless required to fill gaps in trees—should be shortened back to the two buds nearest to the base.

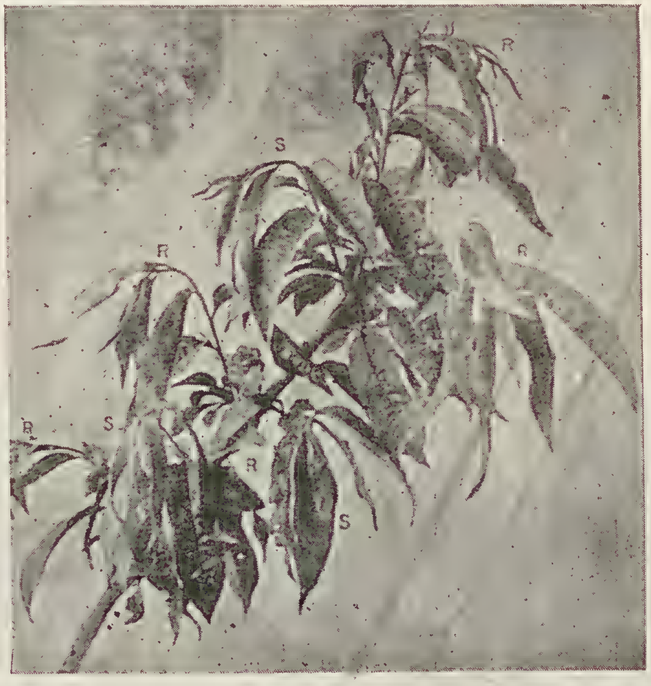


Plate III.
Peach Branch showing the usual overcrowding of shrubs.

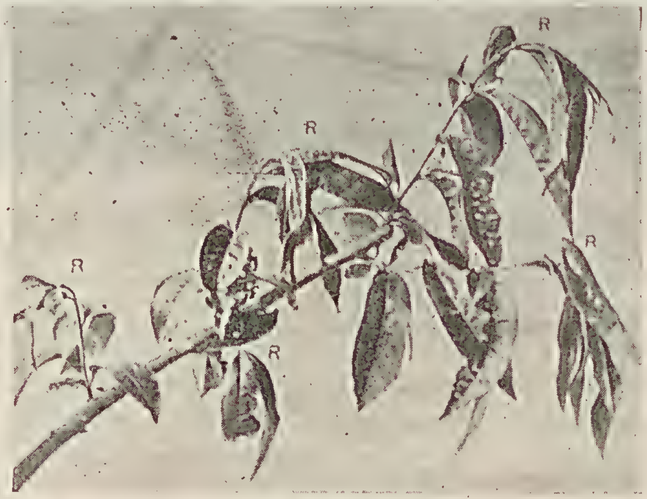


Plate IV.
Branch in previous illustration as disbudded.

Plate VI. shows these two shoots pruned as related above. The shortening back should not be performed until the fruits are well "set"; otherwise the forcing of growth from the shoots located at their points of adhesion would most probably cause some of them to be shed. The last phrase of this, work, viz., fracturing shoots to induce the formation of fruit-bearing spurs, is applied chiefly to the pip fruits, such as the apple and pear, but sometimes to the plum also. For the first few years after being set into the orchard these trees under favorable conditions make very strong growth indeed. The hard winter pruning needed to form a stout-limbed tree aggravates this tendency, and causes almost every bud which grows to become a long and slender shoot. Cutting these again the next winter only increases the difficulty by multiplying the number of rank shoots. Of course the leading shoots must be cut back fairly short for several winters to secure shape and stability, but it is a mistake to treat lateral shoots likewise, for the reasons given above. Recognising the difficulty of overcrowding the branches, many pruners entirely suppress most of the lateral shoots and leave the lower portions of the main arms and branches quite bare and unproductive. A better plan is to retain a reasonable number of these laterals and transform them, by means of fractures made near their bases, into short stubby growths, which eventually become fruit-bearing spurs.

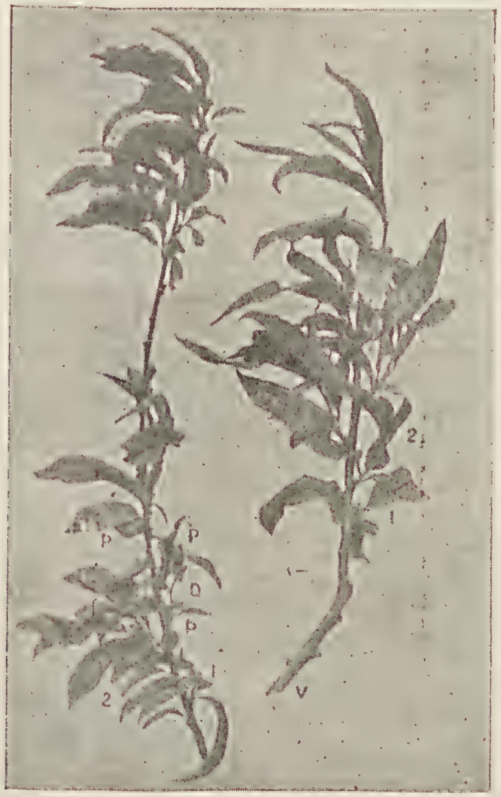


Plate V.—Showing barren growths on Peach limbs.

FIG 1. FIG 2.

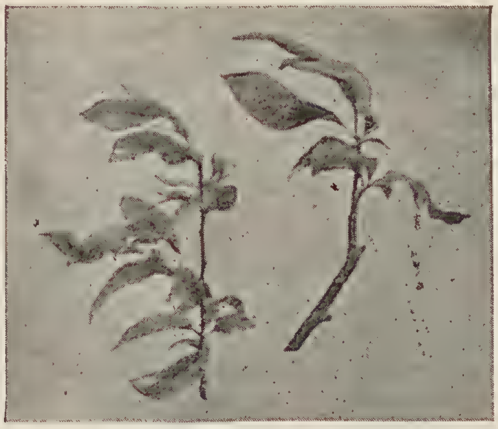


Plate VI.—Barren growth shortened in to refurnish with fruiting wood.

No fixed time can be set down for this operation, beyond stating that when the summer is waning the shoots will be in a condition favourable for the work. The pruner should try to note the time when growth is practically done and the sap has begun to recede.

The lateral should be either broken over a knife-blade or between the fingers above the second or third bud from its base. It must not be severed completely, but merely broken half through and allowed to hang down The hanging portion remains green, and assists in the vegetation of the tree, and absorbs a certain quantity of sap, thus enabling the buds upon its unbroken base to develop into short stubs, but checks further development into long laterals should the supply of sap be moderately large.

If a late rain occurs and the tree is stimulating to second growth, it may be necessary to rebreak any strong laterals arising from the buds designed to be spurs. In the treatment applied during the following winter care must be taken not to make a clean, quickly-healing section below the fracture. This would cause the topmost spur to lengthen into an unwieldly lateral, and the pruner's object in causing the fracture would be defeated.

This method of inducing fruitfulness, as applied to young pip fruit trees, is to be commended to our orchardists, in that it not only saves time in winter pruning, but will ultimately place much fruit where it is safe from storms and within easy reach in harvest time.

This is a practice which can be cheaply applied, and in most seasons one operation suffices. The tedious attention required in constantly pinching back the growing laterals as recommended and practised in Europe in the formation of fruit spurs upon pear trees could not in all probability be adopted here by commercial orchardists owing to the cost of labour, but this practice will actually conserve labour as well as the energies of the tree.

In support of the contention that it is a labour-saving practice, I may say that I made a test of this upon two pear trees of equally vigorous habits of growth, planted about six years previously. The strong laterals upon one tree were broken, during January, those upon the other were left intact. The winter following I carefully pruned these trees. The tree upon which the laterals had been fractured took ten minutes to prune, while the other occupied upwards of thirty-five minutes, and the result has proved far less satisfactory.

Selecting Orchard Trees.

By C. Bogue Luffmann.

Of all the difficulties attendant on establishing a new orchard, nothing is more pronounced than the scarcity of trees which fill the requisite conditions.

The number of trees planted annually is appalling from the orchardist's point of view, when it is observed how few survive and become sources of profit. The causes are at both ends of the tree's career—in the place where it receives its birth not less than where it receives its burial.

In the first place, many trees are not well made; in the second, a little neglect or adverse weather, and the rest is easy.

What are the common defects of our young trees? They are made in too great haste, and in many instances they are not made at all—as trees—but only as something conspicuous enough to receive the name.

Old "staggy" stocks are frequently used to force strong shoots in a single season, and these in turn are pinched during summer, and a pseudo set of branches forced from a green and cabbage stalk class of wood. This is our normal two-year-old tree. These summer-pinched trees are no good, as the branches are not really branches capable of yielding useful growth, nor is the stem below them of much more worth, for in the absence of leaves being allowed to ripen, no perfect sap has formed, and, consequently, the stem is unripe and valueless.

It will pay to have well-made trees, cost what they may.

A good tree is cheap at a shilling, but a bad one is dear at a gift.

The sending out of dried-up and half-dead stock should be at the risk of the vendor. The manipulating of trees to make them appear what they are not should be regarded as much an offence against the person as the adulterating of wine or any other food stuff.

Those who cannot protect themselves and are worthy of protection should receive such aid as the State can give.

The fruit industry cannot be any more to the average man in the future than it has been in the past, unless he starts from safer premises, and secures a bundle of trees which are not only true to name but all they should be in root, and trunk, and branch.

Vegetable Gardening.

Notes on Vegetable Growing.

[From "The Journal of Agriculture." By C. Quinn.]

On the plains country a successional sowing of all of the melon family should be made, and as this season is somewhat advanced, every chance should be given to the late starters. A plentiful supply of well-rotted stable manure, worked into the soil prior to sowing, and occasional doses of liquid manure when developed leaves appear, are the best means to secure this result.

Most melons thrive in humid temperatures, and overhead watering, by means of sprinklers running very gently, when the sun is not too hot, bring about such conditions pretty successfully.

Sowings of dwarf and runner beans will be continued. I wish to repeat again the need for covering the seeds with pulverised manure if a good even germination and stand of plants is hoped for.

These do not require richly nitrogenous manures, such as "fat" barnyard manure; but good results accrue from the use of phosphatic manures, such as superphosphate.

A good plan is to sow the seeds in the drill, cover them lightly with soil, on to which a thin sprinkling of the super. is dusted. On top of this spread the manure mulch.

Potatoes and onions will be harvested on the plains. The latter should be put away carefully as soon as dug, to checkmate any attacks of the potato moth. The keeping onions require to be handled carefully.

Every oniongrower should select a few of the best bulbs for the purpose of obtaining reliable seeds, and before the flowers expand a finely-meshed cheesecloth should be wrapped around the heads—not touching them—to prevent hybridisation with inferior sorts.

The sowing of Red and Silver beets, and lettuces, cresses, and radishes, for salad purposes, will be continued. The three last-named should be sown in shady, cool positions. Given abundance of water and liquid manure to force them, these salad plants may be grown fairly well on the plains, but the cool, damp gullies of the hills are the main sources of supply for the summer months.

Tomatoes are now pretty well advanced, and those trying to secure good early fruits should keep the flowerless side shoots pinched out, and the main shoots tied up firmly to supports.

When the ground is warm in summer, the fruits almost resting upon the ground ripen most evenly; but in the spring, a wall or close fence on the south side, to reflect the warmth, gives the best results upon tomatoes staked fairly well above the surface. There is time now to set out young tomato plants for bulk crops. Egg fruit and capsicum plants should also be set out.

Asparagus plants should now be allowed to make unchecked growth, and dressings of potash and soda manures, as well as a surface mulch of decayed stable manure, could be applied to them advantageously.

In dry localities, good soakings of water should be given immediately after these manures are spread.

In the hills, pretty well all kinds of vegetable, will be grown upon the rich, sheltered flats, sowings and transplantings following each other somewhat like they do in early winter on the plains, with the exception that summer and winter vegetables are not so clearly defined as on the plains.

With the advent of warm days evaporation will be enormous, and to counteract this loss of moisture the surface soil between all growing crops of vegetables should be frequently stirred, more especially after rain showers or irrigation.

——o——

THE VEGETABLE GARDEN.

Top-dress Asparagus beds.

Sow for late crops—Peas, Potatoes, Radish, Carot, Parsnip.

On soil situated near water plant late varieties of Cabbage, Cauliflower, and Lettuce.

Sow all varieties of summer vegetables, such as French Beans, Tomatoes, Trombones, Turk's Head, Cucumber, Watermelon, Sweetmelon, Cape Gooseberry, Capsicum, and Egg Plant, Sweet Corn.

When planting out Tomatoes and other seedings care should be taken to protect them from cold winds and frosts.

Culture of Tomatoes for Canning.

[From "The Agricultural Gazette" N.S.W.]

Dr. E. J. Dirickson, Worcester County, in "American Agriculturist," writes as follows :—

For the past five years I have been a tomato grower to what might be considered a large extent, having 50, 60, or even 80 acres under cultivation. The smooth, round, medium red varieties are best. I will confine myself to three, all equally good—"Ignotium," "Trophy," and "Favourite." To be a good variety it must ripen uniformly and have many cells in its interior, thus assuring as much solid substance as possible.

Planting and Cultivation.

Proper planting of seed is very important. Select a light, loamy soil as near the tomato field as possible, and spread it heavily with fine stable manure, ploughing it in 5 inches deep prior to the seeding, which in this locality can be done with safety about April 10th. [In Australia this would correspond with about September or as soon as dangerous frosts need no longer be apprehended.—Ed.] It should be well cultivated and rolled smooth.

If cultivation by the harrow is intended, mark out the rows 3 feet apart with broad and shallow furrows. Sow the seed by hand so there will be about twenty plants to the foot, and cover lightly with a rake about half an inch deep.

If the season bids fair to be a dry one, it is better to run a light roller over the rows of seed, after first putting fertiliser on the furrows at the rate of at least 1,000 pound per acre. Seeds planted in this manner should grow rapidly. When about an inch high, shallow cultivation should be repeated every four or five days. The manure renders the soil very light and porous, making it easy to pull plants. They come up without broken root or bruises.

When the plants are about six inches high they are ready for setting in the field. In my county, land best adapted for this purpose is a red clay soil that has been in clover, peas, or wheat the previous season. The soil should be of a close firm texture, well-drained, ploughed to a depth of about six inches, harrowed and rolled at least one month before setting the plants. If a machine is used in marking, no furrowing is necessary. If the plants are set by hand, it is best to mark the ground shallow one way, and marking with a deeper furrow crosswise immediately after setting the plants. If the fertiliser is put in the hill, it should be well scattered, as tomato plants are often killed by coming in contact with the phosphate. I generally prefer to fertilise after setting the plants.

If the ground is very dry, the plants after being pulled should have their roots puddled in mud and set out before drying. They should be put well in the ground and the earth pulverised finely around them. If a plant is very tall it is better to lay it down in a furrow, only showing three or four inches above the soil. Having set the plants about four feet apart, or, in very good soil, 5 feet apart, they should be cultivated at once, and repeated shallow cultivations should be given every five or six days. If the land has been thoroughly well prepared, and contains a sufficient vegetation from last year's crop, there is little danger of drought or scald. I believe that blight can in a measure be lessened or even prevented, by thorough preparation of the soil. To reach the highest possible yield, the land should be spread with manure after being ploughed —the more the better. The last working of the ground should be as nearly level as possible, and cultivation should cease when the plants have grown half-way across the rows.

The best variety of fertiliser is one that contains nitrate of soda and muriate of potash. I beleive that 1,000 lb. to the acre would amply repay the producer in the increase in yield. A tomato grown on poor soil will yield about 350 1-lb. cans per ton; while the most perfect fruit, grown on rich land, will give at least 500 1-lb. cans. Therefore, not only the grower is better paid, but the profit to the canner becomes more. I have noticed land that will grow peaches in the greatest perfection is the best variety of soil for the tomato.

In the cultivation of a large field of tomatoes I have always left several roadways for hauling and handling the fruit. I generally have the fruit gathered in five-eigth baskets, rejecting the imperfect ones, but always pulling them off and throwing them on the ground. Tomatoes should not be poured from one basket to another, as it bruises them.

A tomato patch should be picked every three days and if they ripen very rapidly, it is better to pick them very close. The fruit should be of uniform ripeness when delivered to the canner and should be hauled in a spring wagon.

Disease and Insect Pests.

To prevent tomato blight, if the top of the plants were dipped in a weak solution of Bordeaux mixture, it would be a great benefit. They can be easily sprayed in the bed before they are transplanted to good advantage. This, followed by spraying twice during the cultivation, will most always prevent blight. A tomato crop should never be grown two years in succession on the same land, nor should it follow a crop of potatoes.

A great deal of good can be done by destroying the moth that lay eggs for tomato worms. If there are any jimson weeds in the adjoining fields they will always frequent these. They can be killed by paddles or destroyed by poison. A weak solution of cobalt placed in the blossom of the jimson weed will destroy a great many of them. I think fires built around the tomato patch will also help to destroy them. The egg is deposited on the under side of the tomato leaf, and if one watches the moth, he will find that it is erratic and will visit almost the entire field in the course of an evening. Its capacity for laying eggs is immense. Perhaps several thousand will be laid by one insect in the course of a few days. The old-time remedy of using a flock of turkeys is an excellent one. To save my patches I had to resort to a weak solution of Paris green. One ounce of Paris green to 50 gallons of water makes a strong insecticide. This can be put on by an ordinary sprayer on wheels or by hand.

How Tillage Retains Moisture in the Soil.

The following article by the late professor E. S. Goff of Wisconsin U. S. A., gives the most lucid explanation of the theory and system of soil cultivation that we have ever read.

Scientists tell us we have rainfall enough during the year for the largest crops, if we could only save it. The statement has often been made that we can save water by tillage. This has been proclaimed from college rostrums, written and reiterated through the agricultural press, harped and chanted at farmers' institutes until to many of us the subject has become stale. I suppose that most of you accept the proposition on faith, but you do not know how much of reality or tangibility is in it. Sometimes you doubt the truth of it; you would like to see some proof; you do not understand it. Ploughing the land seems to make it dry faster; you want more evidence; you are open to conviction.

When we hear the theory expounded it seems all right. By ploughing the land we make a million little cisterns beneath the surface. These catch the water and prevent it from forming into streams and running off. Especially is this true on nearly level ground. But when the sun comes out will not this water dry out as fast as it came? Certainly it would if we permit it to.

The theory that tillage saves moisture is simple enough. Suppose this book which I hold in my hand were a brick. If I were to wrap a brick in impervious waxed paper and set the brick up in a shallow pan of water you all know that the water would gradually work up through the brick until the top end became wet, and then it would begin to evaporate from the upper end of the brick. Now, suppose we slip the brick out of the waxed paper and break it into pieces the size of a kernel of corn, then dry these fragments over a fire and pour them back into the waxed paper case again, we can readily understand that the water will not creep through the pieces of brick as rapidly as it did through the unbroken brick. The water has no power to jump from one fragment to another, and it can only pass from one fragment to another when they happen to be in contact, and these roughly broken pieces will be in contact only at their corners. Thus the passageway for the water is reduced to a mere fraction of its former capacity. You will also recognise that if the brick were all broken into fragments we could not get all the fragments into the same space that the unbroken brick occupied. When we crumble the surface layers of the soil we raise the surface level, hence the water not only has to travel further than it did before to get to the surface, but its passageway is largely destroyed. By harrowing down the surface of our ploughed fields, or by cultivating the surface after it has been compacted together by rains, we form a crumpled layer of soil through which the water from below can hardly rise. The drier this surface layer becomes the less water can pass through it.

The Barrel Strawberry.

The Barrel Strawberry Culture, which made a little bit of a sensation here a few years ago, and which was so successfuly translated to Europe, especially England, still holds public attention there. So much so, indeed, that an enterprising firm in London has introduced a specially constructed barrel on a revolving base. It is claimed that "this plan of cultivation possesses great advantages of economy in labour and space over ordinary methods. With this system the plants may be forced without glass, and a large outlay for building, heating apparatus, and labour is saved. In each barrel is placed a wire box; this should be filled with good peat manure or stable manure. The watering of the earth surrounding the box is done by an ordinary rose watering can. If it is not wanted to force the plants, the wire box is simply stuffed with hay, straw, or even ordinary leaves. If the contents of the box be watered twice a week the plants will keep perfectly fresh. A ring of iron fixed to the bottom of the barrel rests upon three small wheels working on a second iron ring placed upon two pieces of timber or bricks sufficient to give the whole a solid base. The barrels may be easily turned so as to give each side its full amout of sunshine. The barrels take up but little space, and may be placed along the paths of a kitchen or other garden, against walls, on a terrace, or on a plank in a farmyard where, under ordinary circumstances, it would be impossible to use the ground for cultivation. The iron-bound barrel painted inside and out, pierced with 100 holes, is 15s.; revolving frame complete, 15s.; wire manure box, 5s.—*American Gardening.*

Although tomatoes can be grown to perfection in New South Wales, it is not an unusual thing to see large quantities of American canned tomatoes offered for sale in Sydney. The amount of money made out of tomatoes by the Americans is considerable. The Minister for Agriculture has received from the Indiana Experimental Station their report on crops in the States for 1901. It shows that in Indiana and Maryland 2,159,000 cases of canned tomatoes were packed, the value of which to the farmer would be nearly £300,000.

SPECIAL OFFERS.

6 Good Hardy FERNS, post free for 5s., viz.:—

1 ASPLENIUM BULBIFERUM
1 PTERIS SERRULATA
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A. J. R. WIMBLE, A.I.A., S.A.,
Manager for the Proprietors of "The Australian Gardener,"
61, Brookman's Building,
Grenfell Street, Adelaide.

SHOWS IN NOVEMBER.

Nov. VICTORIA.

3—R.H.S. of Victoria, Masonic Hall, Melbourne. W. R. Church.
5—Brighton H.S. C. L. Rees.
6, 7—Smeaton, Spring Hill, and Bullarook A.S. J. T. Yates-Clamfield.
12—Carnation and Dahlia Soc., Athenæum, Melbourne. F. S. Bryant.
12—Heathcote A.P. & H.S. H. Bradshaw.
13—Bairnsdale District P.A. & H.S. L. S. Moody.
12, 13, 14—Ballarat A. & P.S. J. J. Kelsall.
14, 15—Rose Show, Exhibition Bldg., Melbourne.
19—Kyneton A.S. W. A. Hoyle.
19—South Gippsland A.S., Yarram. R. A. H. Connor.
20—Ballan and Pentland Hills A. & P.S. J. M. Muntz.
21—Ballarat H.S. T. Mitchell.
26—Kilmore A.S. J. Osburn.
20—Condah P. & A.S. H. Baker.
27—Dandenong and South Bourke A. & H.S. Lieut.-Col. Rodd.
27—Mansfield A. & P.S. H. J. Lewis.

QUEENSLAND.

21—South Queensland and Border P. & A.S. H. J. Cooper, Nerang.

SOUTH AUSTRALIA.

6—Yankalilla Agric. Soc.—J. E. Heathcote.
10—Onkaparinga Show. G. F. Lanterbach, Woodside.

◆

Nov. **SOCIETY MEETING.**

1—S.A. Gardeners' Society, Waymouth Street, Adelaide, 8 p.m. J. P. Knight.

[Secretaries of Horticultural, Floricultural, or Gardeners' Societies are asked to kindly send dates and reports of their meetings.]

Rose Number.

The Australian Gardener.

SATURDAY, NOVEMBER 1, 1902.

Editorial.

October is the month of glory in the botanical world of Australia. City, suburbs, and country vie with each other in beautifying the earth, and the growers of flowers are all as busy as bees in collecting their precious beauties to show. Every little hamlet, town, and city has one or more exhibitions of flowers during this month, and however fickle the weather may be, it adds but more zest to the competition of specialists and lovers of the beautiful in Nature.

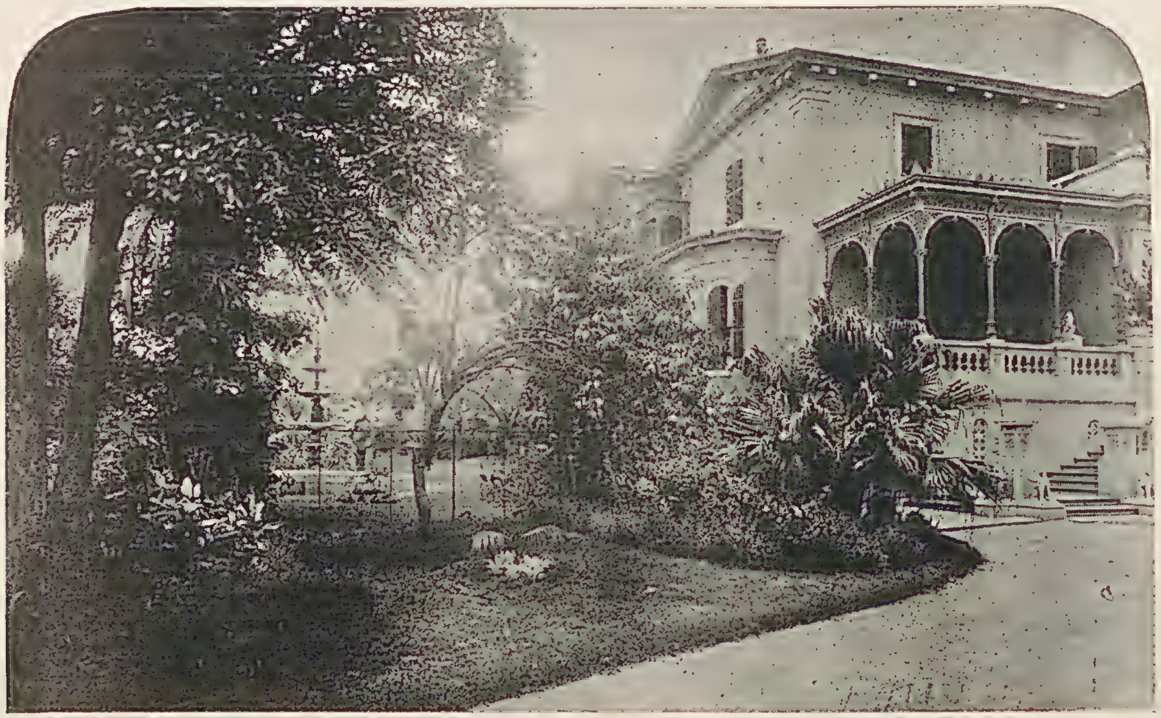
The Rose, the Queen of Flowers, holds high court during this month, and we have much pleasure in presenting to our readers some record of the proceedings of the Queen from the time of preparation for the court ceremony up to the time of the great functions themselves.

The articles and illustrations of our Rose Number are prepared by specialists. The artists engaged in this production are to be congratulated upon the excellence of their work, and we venture the opinion that nothing better has ever been put before the public of Australia.

We have to express regret that owing to the demand upon our space for this special number, we are obliged to omit a quantity of interesting matter sent in, and already put into type for publication.

MONTEFIORE.

NORTH Adelaide has a great reputation for beauty spots. This arises from the fact, whether actual or otherwise we are not prepared to vouchsafe, that "on the hill" most people have residences of their own, and consequently more or less money to spend on them. Hence the term "fashionable" is the designation given to the northern part of the City of Adelaide. Be all this as it may there is no gainsaying the fact that North Adelaide is laid out in the October month with a fascinating floral beauty. Many of the residents are proud of the architecture of their houses; some may have justification for such variety, but with this we have nothing to do. It is the beauty in Nature, aided by human intelligence and art, which concerns us. For reasons that that shall be amply apparent as this article proceeds we approached the owner of "Montefiore," His Excellency the Lieutenant-Governor of South Australia, the Right Hon. Chief Justice Sir Samuel James Way. The gentleman himself, apart from titles, is noted for many things, and particularly his hospitality and generosity. This gift, or bump, or attribute, or anything else one may wish to call it, extends to people who we presume are entitled to it, but His Excellency seemed to draw the line in having his pet corner of sequestration trespassed upon by the journalistic vandal. You may go to Government House and describe the grounds and gardens there as much as you like, the public are entitled to know something about that; but my "Montefiore" is a place of joy where I can seek seclusion from public life to rest. His Excellency did not express himself in those very words, but that seemed to be the trend of his thought when he made it evident that he had time and again refused the approaches of leading Press representatives to describe "Montefiore."



The private residence of His Excellency the Lieutenant-Governor of South Australia, the Right Hon. Chief Justice Sir Samuel James Way, Bart., at North Adelaide.

Upon making it clear to His Excellency that our sole object in describing "Montefiore" was to encourage amongst the people a growing love of the beautiful in gardening he generously consented, and we offer our thanks for the privilege of bringing before the notice of our readers what we consider a unique beauty spot in the art of gardening.

Like most other landmarks "Montefiore" has a little history, but with this we have nothing to do, except to remark that the public should feel gratified that during the many years that the place has been the residence of His Honor the Chief Justice he has maintained a keen interest in trees, shrubs, and plants of rare peculiarities. This interest is largely shared by his head gardener, Mr. David Cole, to whom we accord a word of the highest commendation for presenting the garden, during a very short regime, in such an artistic and charming fashion. The grounds are small wherein to apply the art of landscape gardening, yet the picturesqueness of the surroundings of the house claim constant admiration.

Making an inspection of the garden at "Montefiore" is a great delight. The predominating idea is to give happy surprises. Close at hand and in the distance the common practice of gardeners in laying out their treasures is to enable the visitor to see everything in general effect almost at a glance. This is a physical impossibility at "Montefiore." Comparatively small as the area is, it takes hours to see all that is shown there. An immense quantity of growth and yet no overcrowding. One thing is not allowed to spoil the effect of another. That is where the art of the gardener is particularly manifest.

The views within the garden are charming enough in their variety, but the vistas are so arranged that distance is gained by taking in objects and landscapes beyond. There is the happiest blending of the ancient and the modern. The oldest countries in the world, the European, British, and Australian, in all their ancient setting of Palms, Cycads, forest trees, shrubs, and old and new annuals. Old English favourites that we read about in Shakspeare are there growing side by side with the newest varieties of present day catalogues. A charming and most suggestive combination of the old and the new. No two ideas of plan or design the same, but an ever changing charm. The walks have the delightful uncertainty of ending nowhere, they seem to lead to anywhere and everywhere, for ever winding and nothing wearying. Here a peep under overhanging branches, there a shady nook, and anon a broad refreshing green lawn broken by a group of graceful Palms, and bedecked with a bright hue of colouring, a clump of gorgeous red, and a spray af white and delicate tinting of harmonious colour.

This somewhat bewildering charm of

gardening stands upon the crest of Montefiore Hill, overlooking southward across the Torrens Valley at the foot to the city beyond. In this valley is a mass of forest growth stretching as far as the eye can reach to the east, with the Mount Lofty Ranges in the background. Looking westward the foreground of the valley is of forest trees, with a glimpse of the Torrens Lake, and beyond is the industrious, manufacturing town of Hindmarsh. Beyond the smoke and grime of towering chimneys is the coastline of St. Vincent's Gulf, carrying the ships of merchandise to lands beyond the seas. Surrounded by such stretches of views we have an ideal spot for a city gentleman's residence.

Now to particularise upon the garden. Beginning at the entrance gates, the first item of detail that catches the observant eye is the tiling around the garden edging. This is a particular that too frequently escapes the attention of those whose business it is to lay out a garden. Neat tiling is a rarity. And yet few things give a more ragged effect to a plot of garden than bad tiling. However well-kept and beautiful a lawn may be it is invariably spoiled by tiles that have a jagged and unkempt line. Here we were pleased to note that the tiles were laid perfectly. We have never seen them better, and they add very materially to the appearance of everything else. The same remark applies to every other feature of the garden, notwithstanding that there does not appear to be any special effort at designing the planting of annuals. This lack of effort and yet general effect is an illustration of the old proverb ars est celare artem. This absence of formality is refreshing after visiting so many gardens where the designs are so apparent, and although pretty and decidedly effective.

Looking to the right from the entrance gate is a beautiful lawn of buffalo and Kentucky bluegrass, which are knitted well together. The lawn is broken up by garden plots, shrubs, and trees. These are all made accessible by a winding grass walk. Here we note Palms of various orders of magnificent growth and stately heights, and Bamboos, Yuccas, Cordylines, climbing Roses, Myrtle, a fine specimen of Prunus Pissardi, with its rich bronze foliage, and the quivering scintillating leaves of the Sterculia, also Hibiscus grandiflora, two fine specimens of Auralias, a giant Opuntia, the native forest ti-tree, a Dasylirion, and a Bird of Paradise flower (Strelitzia). Crowning the whole general effect of this collection are two giant Erythrinas (corral tree) with their masses of red blooms, giving a gorgeous display. To mass together such a collection of trees, shrubs, and plants with anything like the effect here produced is the work of a masterhand, and this is apparent from every view taken of it. From whatever point taken the effect is distinctive and good. The variation of foliage and colouring is always striking and pleasing. Not a foot of space is wasted. Annuals and perennials are all there to give the necessary colouring of boldness or in tinting as required. No opportunity for accelerating natural effect is wanting. The trunk of one giant Palm is trailed with the graceful Asparagas fern, while another is massed around with a luxuriant growth of Cactus Cereus Speciosissium, upon which the deft hand of the gardener has grafted Epiphyllum truncatum. The effect of this is delightful. The great white blooms of the night flowering variety give a splendid show with the crimson blossoms of the other. This happy idea is the perfection of simplicity and a great attraction to visitors at "Montefiore."

While moving about on this lawn one is struck with its soft springy character. It is a mixture of English grasses, the matted fibrous roots of which will stand almost anything, and keep green all the year round.

Approaching the house we note a Wistaria, and under the shade of the wall a lovely lot of yellow Carnations, which unfortunately are nameless, and an edging of deep rich blue perpetual Lobelia. From the steps leading up to the front door a view of the drive is obtained to the gate, the right hand side of which is a mass of full-grown trees of various kinds set in a bed of couch grass and small beddings of annuals, the old English cottage garden varieties predominating for choice.

Walking from the house towards the gate, a halt of a few minutes is taken to look at the view across the lawn in front of the house. The centre is taken up with a fountain, round about which are grouped a variety of palms, cycads, and dracaenas. Peeping out here and there are the flower borderings and the rose bed, backed up by a unique trellis, which we shall presently describe. This is a charming little landscape view, with the foreign and native birds moving about, unconsciously adding to its picturesque life and beauty.

Turning from the drive on to the winding pathway leading westward, we pass through a little wicket gate and under an archway of roses. This is called the "bamboo walk," a variety of the canes being in evidence in the borders, where also we note Polyanthus, Primroses, Aquilegias, Geraniums, Pelargoniums (a nice assortment of regal varieties), and other familiar but well-selected choice of flowers. Special attention is arrested by a Glorie de Dijon, trained in a way not commonly seen, but very effective. The old sprays are bent-trained in graceful curves, instead of being pruned short back. The effect of this is to give a greater profusion of blooms for a longer period. Turning round on this path, and facing towards the east, the visitor gets yet another view of the eastern lawn quite different from the two already described, notwithstanding that the palms, trees, bushes, and plants are of course the same. Turning again and proceeding along the walk, noting the borders, we come to a path at right angles leading to the fountain on the lawn facing the house, and from here again we get another glimpse of the eastern section of the grounds, with the giant growth of cordylines, coral tree, and palms breaking up the skyline, under which, and away in the near distance below, figure the rising towers of the Cathedral. Proceeding across the lawn, an inspection of the bordering under the windows of the house discloses a number of old favourite flowers, conspicuous among them being a fine specimen of Dracaena Draco (dragon tree), the growth showing that the pseudonym is very appropriate. Here, too, is seen an illustration of how standard roses can be artistically trained upon rustic stakes into pillars of beauty. Also a demonstration that most things can be done with roses when you know how. Here are a number of standard roses, full of many years of growth, looking well and strong, which were transplanted in February. To talk about transplanting roses in February would awaken the derision of most fanciers in the business of rose-growing; but a pennyworth of practical demonstration is worth a great deal of conservative ignorance. Here we note another little touch of art in the planting of a Leycesteria formosa, of Himalayan habitat. But for this the aspect would look flat. Turning again to view the lawn, we note the fine specimens of Diplothemium maritinum, regarded by many as the very best of the palms, Chamærops, Cycas revoluta, and others of merit. Hard by the fountain, and standing on a corner of the flower bed, is conspicuous amongst other shrubs a Rhyncospermum jasminoides of excellent growth and in full bloom. An archway of roses leads on to the bamboo walk again, from which elevation a view or the city is obtained. A number of old trees have been rooted out of the border here, and choice shrubs planted, amongst which we note Weigela Amabilis, W. Lemoine, and W. Rosea, several Bouvardias, Carpentaria Californica, Acacia cultriformis, Hisbiscus cyracuse alba plena, golden fleece Abutillon, Prunus pissardi, double flowering peaches, and others. A rare and choice collection. Passing along the walk, and looking across a continuation of the spacious lawn, the eye takes in a circular bed of roses, and beyond a fine native tree of a weeping habit of growth, 30 feet in height, evidently of the Pittosporum order. Here also a splendid bush of the old English golden yew. This view has the greenhouse and fernery to back it up. Running over the roof of the fernery is a mass of Tropæolum tricolorum in full bloom. This beautiful creeper is growing with the rankness of a weed, and not appreciated here as it is in England, where a guinea a bulb is demanded for it.

Meandering again to the end of the bamboo walk, we enter the latest innovation at "Montefiore." Mr. Cole speaks of this as a "pergola." In reality it is a long trellis walk. The design, however, has nothing in common with the ordinary garden variety of agriculture. It is adapted from the latest introductions to English gardens, the idea having come from the old monasteries wherein the peripatetic priesthood take their daily round of subjective thought and gain their didactic learning. But instead of huge carved pillars supporting rustic beams whereon the delicate tendrils love to twine, Mr. Cole has had to adapt his design to circumstances. The uprights of the structure are double posts 10 feet high, 2 feet apart, with 4-inch mesh of wire netting to support the creepers. The uprights carry cross-beams 2 feet apart. Each post is 9 feet apart for a length of 30 yards, and 12 feet wide. The structure is simple in the extreme, but very effective, and when interlaced with all the beauties of the choicest climbers now beginning to throw up their tender shoots the effect will be a delight of colour and gracefulness, completely hiding the now somewhat gaunt looking timber. At the end of this "pergola" is a rockery of fantastic design, one of its chief uses being a drinking place for the native birds. Of these His Excellency has a rare collection.

We are now on the other side of the lawn. The view from here is refreshing, the rosery adding beauty to the scene.

With reluctant steps we now turn away from the open garden, the traversing of which is a pleasant and liberal education in the plotting out of a gentleman's residence worthy of the highest commendation.

Our space now forbids a description of the greenhouse, ferns, the rockery—which is a little dream of art—and the orchid-house. We shall reserve these for our next issue. Suffice it to say that the gardens of "Montefiore" are a standard of beauty and art that do infinite credit to His Excellency and to Mr. David Cole, the head gardener.

Garden Operations.

Flower Garden.

FLOWER beds should now be ready for the reception of annuals. If the ground was kept dry in the winter it should now be in a sweet, wholesome condition. Annuals for transplanting towards the end of the month should now be sown in seed pans. The hardier varieties may be sown in the open ground. When planting in the spring we should recall the faults of the previous year's arrangement, having made a careful note of failures so as to be able to allot the most suitable position to each subject. There is such a variety of plants, and their tastes are so diverse, that it is possible to find something that will adapt itself to the most unfavourable situation. Not even the hottest and most barren position in the garden need be given up as hopeless when there are Echeverias and Mesembryanthemums of every description to fill up with. Some of these have the merit of looking cool on the hottest day, and are infinitely more pleasing to the eye than the sight of parched, hungry soil. Every particle of ground should be covered with vegetation during the summer months. Each plant helps to screen the other. Fill up all gaps as they occur. The garden should be well supplied with permanent plants, judiciously grouped and arranged, and then it is an easy matter to fill in the spaces and borders with annuals, biennials, and perennials. Hardy Verbenas, Heliotropes, Hibiscus Africanus, and others of that character of a low growing habit, are very valuable as an undergrowth. Now is the season to take cutting of soft-wooded plants. Pansies, Polyanthus, and Primrose that have ceased to flower may be divided. Shrubs can be pruned as they go out of flower, removing all weak, dead, and extraneous wood, and trimming them where they have become untidy.

Lawns will require attention at this season. They should be carefully weeded and all holes and depressions filled up with light soil. Their own mowings are the best possible mulch, and provided the grass has not been allowed to grow too long, and leaves and all untidy matter have been previously swept off, these may remain without prejudice to the appearance. Where leaves are looking shabby a top dressing and manure should be applied. "The lawn," wrote Mr. Robinson, "is the very heart of the garden and the happiest thing in it." Garden paths usually suffer during the winter from the heavy rains and general traffic combined, so that it may be necessary at this season to repair any defects. If they are well made in the first instance they are little trouble to maintain. Paths should always have a solid foundation of hard, rough stuff, overlaid with gravel, sand, etc., of sufficient depth. The highest point should always be the centre. This admits of good surface drainage. They should be weeded now and got into the best possible condition for summer. Turf paths are the most desirable in this climate.

Roses are making vigorous growth now, and may call for thinning and directing. Where quality rather than quantity is desired in the blooms the buds may be thinned, allowing only one to remain for a cluster. Hybrid perpetual and Tea Roses will benefit by an application of liquid manure.

Mulching must not be postponed until the dry season, but should be done as soon as the ground has benefited to the fullest extent by the spring rains. Manure or litter spread lightly will then help to conserve existing moisture.

Dahlias may be planted this month. They are gross feeders, and like a moist soil. Dig large holes for them, and fill with decayed vegetable mould, and allow them plenty of water during the summer. Place a central stake, and as they grow nip back and direct the growth so that the stems may be strong enough to support the luxuriant growth of the late summer with moderate staking. They are among the handsomest and showiest plants in bed or border, and repay a little extra attention at the outset.

Snails and slugs are now very active. They have a preference for our choicest blooms. Their haunts and hiding places should be discovered and lime frequently dusted over the foliage. Trapping and catching them by means of bran and lettuce leaves will do a little towards reducing their numbers.

Flowers in Germany.

(Translated from *Die Gartenwelt*).

NEWER AND VALUABLE FLOWERS FOR DECORATIONS.

(BY TEUTON.)

ASTERS.

BEFORE to-day have I drawn attention to the "Aster peregrinus," which belongs to our best cut flowers, and which is doubly valuable by its early flowering. Early in spring the faintly lilac tinted flowers commence to develop, and very shortly afterwards the flowers appear. Where long-stemmed flowers are wanted Aster peregrinus ought not to be omitted, though the first cost might be comparatively heavy.

Trollius Asiaticus, or Goldball, has been known for several years, but does not appear to be favoured by our gardeners to the extent its beauty deserves. The reason why this flower has not been more cultivated may be in the high price, but even this reason has been done away with of late. Of the different kinds that are known none is more beautiful than Trollius Goldball. A bouquet of these incadescent, golden orange-coloured balls must satisfy even the most spoiled taste. The strongest frosts, which do such a great deal of damage in early spring, never harm our friend.

FEATHER PINKS.

Among the feather Pinks we possess now an important new culture, which is considered by experts as the best amongst white flowering Pinks. Each flower, which grows to the size of a snowball, possesses a circumference of 15 to 17 cm. With perfect right has this new variety been called "Snowball." A bouquet of cut flowers is a picture that brings before the eyes the extraordinary richness of its blossoms. Everyone will be surprised at the powerful growth of Dianthus plumarius "Snowball," at the strong stems by which these mighty flowers are carried. The circumstance that every stem carries only one blossom is probably the reason that the flowers grow to the greatest perfection, and these merits ought to recommend them strongly to us.

DELPHINIUMS.

Amongst the lasting Delphiniums we possess many a pretty variety. For bouquets I think Delphinium Belladonna holds the place of pride. The beauty by which this variety excels lies in the transparent heavenly blue, and in its great productiveness, which supplies us with flowers for nearly four to five months in the year.

CAMPANULA.

Of the beautiful Campanula persicifolia "Moerheimi" we do not hear or see much, notwithstanding that this plant belongs to the best novelties of late years. The plant is not exacting in its culture and pays well for any trouble expended on it. The closely filled, pure white flowers appear at a time when the Pinks are over, and when good white flowers are scarce. The flower is of good use in the "bindery," and these good qualities ought to procure for it the greatest popularity.

PYRETHRUM.

White Pyrethrum sinensis forms in the spring months a considerable part of our bouquet flowers. The "Montblanc" is the best known and most popular kind. "Non plus ultra" has the habit of getting the flower stems entwined, which is not the case with the "Montblanc." In newer times the simple coloured varieties are preferred cut long stemmed.

MONTBRETIA.

I would like to draw attention to a bulb growth between "Montbretia" and "Gladiolus," which will have a good future as a cut flower. It is from the Cape-born "Watsonia Ardernei," a novelty of the first water, which blossoms very early. The snow-white delicately perfumed flowers are set on a strong growth, and keep for a long time when cut. The single flower has a great likeness to the valuable Gladioli, "The Bride," only that the flower is smaller in all parts.

ADVICE TO AMATEURS.

A very low-growing plant which by its white and many blossoms is very effective and allows cutting for table use is Ionopsidium acaule, which ought to be sown and planted out in the same way as "Silene." Winter them in a box, transplant them in the spring, and they will flower for a long time, and will form by their compact growth and abundance of flowers a perfect ornament.

In bluish violet colour, "Linaria Cymbalaria" is a great success. This plant is also richly blossomed, low growing, and stands cutting.

A third plant which ought to be sown early, and which appears in brown-red colours similar to the summer colouring of "Coelus Verschaffelti," is "Atriplex hortensis fol. purpureis." It ought to be sown on the flower bed, and it soon blossoms in a good red colour. It must be sown very closely, and weed out at once the seedings of the green kind which may appear. This plant also stands cutting.

Of great effect are the Sempervivum specialities, of which Sempervivum arachnoideum in the green colouring, as well as in the brown, receive the greater attention. I must not forget Sempervivum atropurpureum, which has a great effect with its dark carmine red colouring.

Another very grateful low-growing plant, which one can eventually cut down to the root, is "Oxalis tropacoloides fol. atropurp" It has in its leaves a dark carmine red glow, and produces in great number small yellowish flowers, which look well against the dark leaves. The one drawback to this plant is that it sows itself out, and therefore springs up again in the next year.

The green "Spergula pilifera," which grows into many-sided uses in summer, is also of value in spring planting; also the white-grey "Santolina tomentosa," whose green remaining stem form is also often used.

Instead of the silver-grey "Antennaria tomentosa," one may also use with success the "Cerastium tomentosum" and "Bieber-steini," which is lasting and hardy, and which will decorate itself still late in the season with its rich white blossoms.

There is also worth mentioning a creeping Veronica. It grows a great number of bluish-white blossoms, remains as low as "Spergula," will stand cutting, and is lasting, so that it stands in the same relationship as the others.

We have now the colours white, silver-grey, light green, brown, and dark grey. For blue we have the low Myosotis, "Victoria"; for red and rose, the Silenen kind. Therefore, here only remains yellow, which will be epresented by "Alyssum saxatile." It grows a little higher than the before mentioned plants—about 15-20cm.—but in the hands of an expert one might be able to grow a miniature form, as in the case of the "Myositis" kinds. With all these before mentioned varieties, in conjunction with kifferent sorts of Pansies for completion perhaps of some necessary colour blendings, one ought to make a good spring show, which ought not to be far behind the rich colouring of summer.—C. Rimann, Vienna.

Early Spring in the Garden.

[By "Hawthorn."]

After the dull monotony of a long and tedious winter, when the eye has long since ceased to be satisfied with mere form and craves hungrily for colour, more colour, every swelling bud, every tender leaf that proclaims the approach of spring is hailed with keenest pleasure. During the winter we look ruefully, if not reproachfully, at the twiggy trees and bushes, the deciduous varieties of which our garden is largely composed and transfer our affections to the faithful evergreens. No garden should be entirely without them, especially the variegated varieties. The golden Oleander, the fresh foliage of Pittosporum Undulatum, the luxuriant and varied foliage of the Abutilons, among others, which relieve the gloom of a winter's day and never fail us in fair weather or foul. But alas! for the frailty of human nature. When the faintest, tenderest, most delicate green appears on the Lilacs, the Guelder Roses, Poplars, Elms, and Oaks, in short everything of a decidous character, our allegiance wavers. The early spring toilette of the Roses, the Tea Roses conspicuously, are indescribably lovely, especially with the sun behind them, they become illuminated, brilliant. The double flowering dwarf Pomegranate can also vie with them in this respect. It is now a blur of reddy-brown; soon it will change this fascinating morning wrapper for a raiment of vivid intensest green, and cover itself with bright scarlet flowers. In autumn its leaves turn to lovely gold, and it is always beautiful. Was there ever a greater variety of tints in the garden and landscape, unlike the sensuous colouring of summer or the gorgeous hues of autumn all is soft, fresh, harmonious, many-toned.

As a striking contrast to the soft shades of the foliage, yellow is the predominating colour among flowers, Wallflowers supply a deep rich tone. In spite of the their name conveys they are rarely given the position they are traditionally entitled to. They are ever associated with crumbling walls, ruins, and simi-wild places, and though we have not these advantages, stonework or rockeries form a good substitute. They are never seen to better advantage than when thrusting their luxuriant trusses of flowers and foliage through the crevices in stone or rock work. A few straggling Daffodils remain to contribute their delicate yellow to the general scheme. Still more delicate are the Primroses, which are still flowering profusely, refusing to be daunted by the preliminary canter of a hot north wind riding roughshod over their tender blooms. The vivid tone of the Berberis is another contrast, and the double Kerria, equally showy, is covering its slender shoots with bright yellow pompons. Like the Wisteria, and a few others, it prefers to pose at first as beauty unadorned, that is to say without the aid of outward adornment in the shape of leaves. A Pine tree, or group of Pines, a little distance form a very effective background to the garden. They are such a strong contrast, their outline is so bold. In the presence of much that is fleeting, the evanescent glory of fruit blossom, the transient lovliness of a rose, the brief and lovely season of a deciduous tree, the pines suggest permanence and stability; they may be regarded as types of the eternal. No other tree invites effects of light and shade to such a degree. The morning and evening mists, blue and purple, lurk in their recesses. The tips of the boughs catch every gleam of light and sunshine, while between are deep, velvety caverns of shadow. There is a particularly lovely Conifer, the Silver cedar. Why does not this splendid variety find more general recognition and acceptance? To see its colour to perfection it should be placed on an upland lawn. The delicate glaucous growth gives an impression of the snows of yesterday lingering on its boughs. It calls to mind other climes, the forests of Germany with their snow-laden Firs. It will be readily acknowledged that these specimens give greater variety to a garden, and it is variety we are striving after, variety of colour and variety of form. The European Silver Birch can be grown quite well locally; it is the "Lady of the forest" of MacWhirter. With a slender form and modest habit it can grace even a small garden. It is beautiful by reason of the exquisite silver stem and graceful pendant leaves. In autumn it drops pure gold.

Amidst a group of plants whose foliage is somewhat delicate and tender a single specimen of something of the character of a Yucca, Recurva Pendula preferably, or better still the Furcræa Bedinghausii form a notable contrast. The latter also serves admirably to emphasise a point. It gives strength and dignity to a garden. It comes from Mexico. What opportunities we have of being cosmopolitan in our garden, of federating the world of plants.

The variegated Bamboo should be a feature in every garden, especially in contrast with the red tones of Prunus Pissardi, which in the lamentable unavoidable absence of the Copper Beach in this climate serves us so admirably as a substitute The garments that the Bamboo elects to sleep in are disgracefully ragged and untidy, but now that it is putting forth the most immaculate delicately-coloured blades we would fain forget and forgive.

The White Lilac is supreme among white flowers, but is only to be won by waiting. For eight years we worried it and coaxed it to bloom, but it remained stolidly indifferent to our entreaties. At the end of that period it began to flower regularly and freely, and has continued to do so ever since.

Lilies of the Valley are now spearing the soil and showing quantities of incipient blooms. They increase amazingly in a cool, sheltered position, and all the attention they appear to require, provided of course the soil is fairly rich, is a mulch of decayed leaf mould just before they begin to move in the late winter.

Success is very stimulating, especially in gardening. Last summer in fear and trembling we attempted some Delphiniums and were rewarded, some really good spikes of flower found us profoundly grateful. This year we intend to profit by Miss Jekyll's excellent suggestion and obtain an effect with Delphiniums and Globe Artichokes, and, better still, Cardoons, and recommend the same to anyone anxious to enjoy a symphony of silver and blue.

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Over-Watering Plants.

UNDOUBTEDLY the greatest sin of growers of pot plants is the temptation to over watering. This is more particularly noticeable in winter when owing to so many plants being partially or wholly dormant there is very little necessity for feeding other than simply keeping the soil slightly moist. Have you never compared the results and the universality of the practice of over-feeding of both human and plant life. Just think for a moment of the multitude of ills that follow in the wake of over-feeding the human body. The results are never so quickly apparent as those arising from starvation. In the latter case we quickly jump at the right cause and remedy it; in the former the protective and recuperative forces of nature are often so long in being overcome that many causes, and very often the wrong ones, are assigned for the ill-conditions resulting.

A pot plant that is repeatedly overfed—A properly crocked drained pot will resist overwatering — especially if in an open and exposed position where the drain upon it by evaporation is great—far longer than the "sedentary" or indoor plant, the digestive organs of which are less lusty and the artificial conditions more enervating.

The navvy, for instance, will, with his hard toil, take twice the sustenance, and without harm, than the clerk in his office will with chronic indigestion.

Then another thing one frequently notices is that plants often look miserable when the cause is semi-starvation rather than over-feeding. This is usually the case where the plants, when being repotted, have too much soil filled in to the top of the pot. Hence when watering just enough is put on to the soil to sink in half or a third of the way, because the water runs over and the pot cannot hold enough. Sufficient space should be left on the top of the pot to hold water enough to soak the whole of the soil and run through; then no more water should be given till the pot is again fairly dry and actually needing it.—F.C.S.

Pope Leo XIII. has always been a great admirer of Geraniums, the double scarlet Geranium might indeed be called his favourite flower. Perhaps on account of its effectiveness for church decorations.

Rose the Queen of Flowers.

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[By A. H. SCARFE.]

OF all the flowers that have been altered and improved in character by careful selection the Rose perhaps holds first rank. Its pre-eminence amongst the myriads of flowers to be found the world over must be conceded. The Rose as the "Queen of Flowers" has been elected to her proud position by universal consent. No other flower in Flora's fair domain possesses her many characteristics. Beauty of form, infinite diversity of colour, delicate and unsurpassed fragrance, adaptability to all climes and conditions, responding magnificently to expert culture, yet blessing the humblest garden plot with her varied charms. These are qualities which entitle her to the pride of place.

Marechal Neil.

Growing on tripod in the garden of Mr. A. H. Scarfe, from which the first prize six roses were cut for the Royal Horticultural Show, Adelaide.

The Rev. A. Foster Melliar, M.A., an eminent English rosarian, speaking as to its antiquity, says:—"Homer's allusions to the Rose in the Illiad and Odyssey are, I suppose, the earliest mention we have. Every one will be aware of Bible references, though it should be mentioned that the Rose of Jericho is generally understood to be a cruciferous plant, and all seem to be agreed that whatever the Rose of Sharon was, it was certainly not a Rose. Nevertheless, Dr. Hooker enumerates seven species of Roses which he observed in Syria." He goes on to say:—"By far the most important ancient quotation is from Sappho, the Greek poetess, who was born about 600 B.C. Mr. Wm. Paul gives in his book a fragment of a translation of one of her poems:

> Would Jove appoint some flower to reign
> In matchless beauty on the plain,
> The Rose (mankind will all agree),
> The Rose the Queen of Flowers should be.

The title of the "Queen of Flowers," therefore, is no modern assumption, but has hardly ever been seriously questioned for twenty-five centuries."

IMPROVEMENT IN ROSES.

The Rose, however, as we know it in its

La France.

One of the finest of the spring and autumn blooming Roses, and for which we are indebted to Guillot, the renowned French rosarian. Introduced in 1867. Formerly classed as a hybrid perpetual, but now classified by the National Rose Society of England as a hybrid tea. A charming Rose, of a pale peach or lilac rose colour, with silvery white centre; of perfect form, and a most delightful perfume, essentially its own, and not approached by that of any other Rose. A general favourite both for the garden and for exhibition. A so-called climbing variety of this Rose was brought out in 1894, but is not to be relied upon as a climber, more frequently than not reverting back to its dwarf habit. The smallest garden should have a few feet of space reserved for "La France," which often produces its best blooms when but lightly pruned and grown in comparatively poor soil.

Muriel Grahame.

Messrs. A. Dickson and Sons of Newtownards, Ireland, the raiser of so many of our best Tea Roses and their hybrids, introduced this charming rose as a sport from the ever favourite Catherine Mermet in 1896. Pale cream in colour, and of a dwarf habit of growth, its fully expanded flowers somewhat resembling The Bride, but without the lemon tint sometimes shown by the latter. A very fine exhibition rose, but requiring skilful cultivation to show it at its best.

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distinct and improved form, may be said to belong to the present century. In 1829 a French grower issued a catalogue with the names of 2,000 varieties, but in 1860 there were not many Roses which were considered good. From 1860 to 1865 the French raisers came to the front, and some wonderful additions were made to the list, many of these being still deemed indispensable, amongst them being the famous Marechal Neil, the finest yellow Tea Rose yet produced. The English growers, being thus stimulated, turned their attention to the production of new varieties, and during the last thirty years an astonishing advance has taken place in England in this direction, notably in the class of Tea Roses, which have advanced rapidly in public estimation. This is owing to their ever-blooming qualities, and to the fact that their list now includes some beautiful dark varieties in reds, crimsons, and magentas, colours which have previously been conspicuous by their absence. This class, which is eminently suited to our warm climate, has by its perpetual flowering qualities superseded to a great extent the hybrid perpetuals or spring-blooming Roses, not only for garden and cut flower purposes, but also as exhibition blooms. The golden tints and delightful blending of shades so wanting in hybrid perpetuals are found here in great variety. It is amongst the hybrid perpetuals, however, that the dark crimson colouring is to be found in great profusion, and these varieties are indispensable for exhibition purposes in the spring. For late summer or winter blooms they cannot be relied on, but several of the dark sorts produce splendid flowers in the autumn and early winter—notably the old Abbe Bramerel, introduced as far back as 1871, and the favourite General Jacqueminot, which has held its own since 1853. This Rose should be in every garden if only for its fragrance, while in the bud state it is perfection.

It is impossible to enter fully into the history and classification of the Rose. It will be sufficient to say that most of us, whether for exhibition or garden decoration, will find all we require amongst the following classes:—

Hybrid Perpetuals, Hybrid Teas, Teas, Noisettes, and Bourbons, the latter being fittingly represented by the old favourite Souvenir de la Malmaison, which has sustained its reputation as one of the best autumn and winter bloomers since 1843. I should also refer to the Polyantha class, well-known representatives of which may be found in Cecile Brunner and Perle d'Or, free-flowering miniature Roses, very beautiful, and excellent for borders and for floral work. For these, which are special favourites with the ladies, we have to thank La Belle France, for I find on reference to the last official catalogue of the National Rose Society of England that the whole ten varieties on the list have been produced by French growers.

My experience in Rose culture has been confined to the classes mentioned, and I will state it briefly. Lengthy cultural directions are unnecessary, as, given general principles to guide them, success is assured by those who will practice perseverance, industry, and self-denial, and who are animated by that determination to excel which has distinguished enthusiasts in all walks of life. Gardening literature of the most valuable description, containing the accumulated wisdom and experience of specialists, is now circulated broadcast throughout the land at a minimum of cost. An American writer says:—"Don't let any one make you believe that successful flower-growing is a matter of luck, and that flowers grow better for some folks than for others. It isn't true. Successful flower-growing is a matter of intelligence, and luck has nothing to do with it. Enquire closely into it, and you will discover that your neighbour, 'who always succeeds with flowers,' owes her success to a knowledge of the needs of her plants. She has made some study of the requirements of plant life. She knows something about the soil and temperature and general treatment her plants ought to have, and luck has had nothing to do with it. Don't let any one say luck to you. It is the lazy man's and the lazy woman's word. Don't trust to its false leadings and teachings."

A FEW PRACTICAL HINTS.

First of all then, situation. This is a

matter in which we have to bow to circumstances, and make the best use of what we have. An ideal situation is one with an eastern aspect, and protected from strong northerly or westerly winds by trees or fences. Where the shelter of a hedge or trees is not available, fences or trellises on which climbing Roses can be grown form the best protection from wind, as the roots of trees or large shrubs rob the Rose bed if at a less distance than 25 ft. or 30 ft. Authorities advocate the planting of Roses in a bed to themselves, but in many cases this is not always possible. I have adopted this principle as far as I can, and after a good deal of hesitation and considerable adverse family criticism, grubbed out a number of vines and plum trees, which were producing fruit for starlings and sparrows, in order that I might establish a small rosery where my plants might grow unmolested, and I could properly enjoy my hobby.

SOIL.

Any ordinary garden soil will grow Roses if properly cared for, but undoubtedly that best fitted to produce them in perfection is a good deep, heavy loam resting upon a clay subsoil. With this good drainage is indispensable, for in cases where the water lies in the subsoil it is absolutely necessary to carry it away by artificial drainage, which is also advantageous, inasmuch as it keeps the ground moist and the surface loose and open. I attach great importance to the preparation of the Rose bed. It entails more labour and expense in the first place, but this is well repaid by after results. The ground should be well trenched to a depth of at least 2 ft., and a good dressing of stable or well-rotted cow manure, with a sprinkling of bonedust thoroughly incorporated with the whole of the soil. This should be done if possible some time before planting.

Mr. C. H. Halstead, of New South Wales, one of the best authorities in Australia on this subject, writes :—“A Rose will send up any number of strong new shoots during the course of its existence, and the secret of proper pruning is to continually, but gradually, change the wood every two or three years. Too many buds should not be left, as most of them will shoot in the spring and produce flowers, and if there are too many of them they will crowd each other and spoil the size of the blooms. The top bud on a pruned shoot should always point outward, and if the young shoots in the early spring appear too thick, some of them should be rubbed off.”

With regard to Roses trained on trellis, fences, or tripods, the latter being a very effective method, the same authority says :—

“The climbing shoots the young plants produce in summer should be allowed to grow straight up, so as to get as much growth as possible before the winter. In August select about two or four of these shoots and train them horizontally (the lowest pair about 12 in.) from the ground, and the next pair about 12 in. above them. Shorten the ends a few inches, and cut clean away the rest of the plant. Each year the same method should be adopted. The number of branches may, however, be increased. Keep the most vigorous shoots the lowest down, and do not forget to change the old wood for the new every few years To obtain autumn blooms on very vigorous varieties it is necessary to train down and shorten the long-climbing shoots in February. For verandah and pillar Roses it will not be possible to encourage much horizontal growth, but for trellises and fences growers should remember that their duty is to keep the bottom part covered; the Rose will look after the top.”

SUMMER TREATMENT.

After the general pruning in July or August the old mulch can be removed, and a dressing of fresh manure given, the former being lightly forked without disturbing the roots. If extra fine blooms are desired, as soon as good growth commences, give the plants a little liquid manure at intervals of about a fortnight until the buds are well advanced. This is best supplied immediately after watering, as it then reaches the roots direct.

I have been asked what treatment to adopt during the summer months. After the October and November blooms there is no difficulty in keeping the plants flowering in the summer months by frequent waterings and cutting back, but seeing that it is labour in vain to attempt to grow good flowers during this period this is the time when your plants should be allowed to rest, watering only sufficiently to keep them alive. A New South Wales authority, previously quoted, says on this point—more particularly referring to the free-flowering varieties :—“An attempt to keep Roses continually in bloom will very materially depreciate the size of the blooms and the vitality of the plants. The growth of shoots and leaves strengthens a Rose, because the roots increase in like proportion, but the production of flowers and seed have the very opposite effect, and are most exhausting to the plant. In cold climates the winter affords a complete rest for several months, which here they do not get. Our most valued, because most lasting, blooms are produced in the late autumn and winter, and if our spring and autumn flowers are required in perfection we have only the summer months in which to rest our plants.”

Kaiserin Augusta Victoria.

Hybrid Tea, introduced by Lambert and Reiter, 1891. A handsome flower standing erect on strong stems; colour creamy white with slight tinge of lemon and high-pointed centre. A grand Rose either for the garden or exhibition; stands the hot weather well, and equally satisfactory as a dwarf or half-standard.

MANURING.

As I am indebted to the same writer for my experience as to manuring, I quote his remarks :—

Natural Manures, Horse, Cow, &c.—These manures will always rank as the best for Roses. For mulching they are invaluable, and when dug into the Rose beds they increase the supply of humus (vegetable matter) in the soil Humus is a most important factor of the soil in a dry climate, because not only does it supply food for the plants, but it greatly increases the water-holding power of the soil Horse manure is particularly suitable in incorporation with heavy or clay soils, and for mulching. It may be used fresh in both cases. Cow manure is more suitable for light loamy and sandy soils, but it should be allowed to rot in a heap for a month or two before used. Liquid Manures—This manure is the most valuable of all manures for the exhibitor, as it can be applied in the early spring and autumn, when it is most wanted to force on the young flower buds, and being in liquid form, the roots are able to assimilate it at once."

I have not given any list of what I consider the best of Roses to plant, because our nurserymen's catalogues are full of information on this subject, and a glance at the tables of our Rose shows will enable you to make your selection without difficulty.

Lady Mary Fitzwilliam.

Hybrid Tea, raised by Bennett, 1882. A seedling from Devoniensis and Victor Verdier. Of dwarf growth, but under good cultivation producing exceptionally fine globular blooms of rosy flesh or pale pink. Most effective when grown as a half-standard, and a good autumnal bloomer. A fine exhibition flower.

Neither have I said anything as to the propagation of the Rose, which is either by raising from the seed—a practice with which we are not likely to concern ourselves—by layering, by cutting, and by budding, an art which can best be easily and quickly learned by taking a practical lesson from anyone who understands it. Literature bearing upon Rose culture is now so widely disseminated that ignorance of these points is inexcusable.

In concluding this fragmentary chat upon a subject which is so interesting to many of us, I can only add that the cultivation of such a queenly flower as the Rose has been to me a source of unalloyed pleasure. The hints which I have given have been acted upon in my own experience, and I have found little else necessary. The Rose is thoroughly cosmopolitan; she bestows her favours impartially alike upon prince and the peasant. She blooms with equal excellence in the garden of the humble cottager as in the ornate domain of the millionaire; she gives an added charm when worn by feminine beauty, and brightens with colour and refreshes with fragrance many a sick chamber. To any who may possess gardens, and can be induced to pay a little attention to the cultivation of this exquisite flower, I can promise that it will prove a very satisfactory recreation. It will entail a certain amount of work, but it is work of a character which will prove a pleasure. It will induce the excellent habit of early rising, for is not the early morning, with its dewy freshness, a period of keen enjoyment among one's Roses. It will enforce promptitude of action for when the caterpillar and the aphis are rampant there must be no procrastination in dealing with the enemy. In short, it is a pleasure which will in many ways act as an antidote to the worrying anxieties which seem to be inseparable from everyday life. The love of a garden and the cultivation of flowers exercise a refining influence upon human nature; it tends to make men better husbands and better fathers; it relieves the monotony of daily lives for many wives, and it gives our children an interest in home life which is of a beneficial and lasting influence. As a mental discipline, therefore, as a physical exercise, as a botanical study, as affording an out-of-door recreation, which gives unmixed enjoyment to oneself and friends I can confidently recommend the culture of the "Queen of Flowers."

Exhibiting Roses.

SOME HINTS TO BEGINNERS.

[From the "Gardeners' Magazine."]

LET me say at once that these notes are intended only for the novice and the "small man." The man of big battalions, surfeited almost with the prodigality of good young blooms ready for him each morning, knows nothing, and cares less about the thrifty wiles of the small growers in their efforts to place before the judges a good dozen on a certain date; and if he peruses these lines at all it will be at best with an indulgent smile.

Good culture, good plants, and good blooms are conditions precedent to successful exhibiting. All these must be assumed to exist.

Each bloom which promises to be of service must be carefully watched and tended, and as soon as the petals begin to show signs of expanding a shade must be fixed over it, to protect from the rays of the sun on the one hand, and from rain and dew on the other. With the majority of Roses a tie or twist of soft thick Berlin wool should be loosely tied round the expanding bloom, gently holding back the outside ring of petals and tying only the point or central petals. This is beneficial in two ways, it prevents the thin-petalled Roses opening too quickly, and also causes the point or centre of the flower to grow and lengthen, and thus the bloom when cut, and subsequently untied, presents a much more shapely and better built appearance than one left to open naturally, and usually on hot days, much too quickly for the due maturity and consequent perfection of the specimen. It is useless to put on the tie more than a day or a day and a half before the show. The best time for putting on the ties is in the evening or in the early morning, but never while the bloom is wet.

On the morning of the show be up and out by daylight with your boxes, with tubes filled with water, in some shady convenient place, and commence cutting at once, and immediately place the blooms in water. On no account leave them lying about after being cut, and when all are gathered take the boxes into some cool shed or room where there is plenty of light, but no sunshine, and begin to get your beauties ready for their court display. This can be done to much greater advantage at home at leisure than in the crowded hall where the excitement which is all abroad is sure to infect the calmest and most phlegmatic amongst us, and frequently impairs our judgment in making our selection from amongst the numbers of blooms we have brought. Suppose we are dealing with a "12 distinct" box. Begin by taking one Rose at a time and gently remove the ties, and with a soft camel-hair bush assist the petals to open—if the bloom appears of good shape, size, and colour, and likely to last in that condition for the next few hours, carefully replace the tie round the central petals, tying rather tighter than when on the plant, and wire the stem of the bloom with a Foster support, and place it in the tube it is to permanently occupy. Begin at the top left-hand corner of the box with the largest and most perfect Rose you have—say a dark one—then next to it put a light coloured one, then dark, and so on, well mixing the colours, and thus making each Rose show up the attractions of the adjacent blooms. The back row must consist of the largest specimens, the middle row of those next in size, and all the smallest blooms must be placed in the front row.

When the box is filled it will present rather a disreputable appearance with each bloom tied up, and only the outer petals showing, but who of us has ever seen a sparkling Sunday belle looking her best in her Saturday night curl papers. Close the lid all but an inch and stand the box aside, and leave it alone until the time comes to carry it off to the show. Do not invite each individual member of your household separately and apart to come to a private view. They do not appreciate the curl papers, and the constant lifting of the lids only admits warm air, and in a sense is disturbing to the blooms.

Never if you can help it lose sight of your boxes on the way to the show. If the hall is near home this is an easy matter, but when travelling by train try to have the boxes in the carriage with you. If this is impracticable make friends at once with the guard, and travel in a compartment near his van so as to be on the spot at once when removing from the train. The average railway porter if left to himself usually handles the box containing your best blooms as if it were an empty milk churn.

When we arrive at last at the exhibition hall we should select some quiet corner and leave the boxes there while we go off at once to the officials' tent and secure our cards. This period of the day is often of a very trying nature to the exhibitor.

Many a time I have been at a show where, according to the regulations, boxes could not be admitted after 10 o'clock in the morning, and it has been twelve or half-past before the judges came round to do their work. It seems to be nobody's fault in particular. The secretary usually receives the blame; and I imagine it is no pleasant task to have to listen to the angry tirade of a disappointed exhibitor whose blooms two hours before might well have received premier honours, but whose chance has been ruined by the prolonged delay.

As soon as you get an intimation that the judges are coming get the lids off, and the ties taken off the blooms. Some of the flowers may appear to have gone off somewhat, and in this case take them out and replace by younger spare blooms, a number of which we should always take with us (but in the hurry be careful to see that you do not already possess a flower of the same variety in the stand or you will be disqualified for duplicates), then raise the blooms a little higher in the tubes so as to make them stand out boldly. Raise the back of the box a few inches above the level of the staging, and prop it up with a wedge or a small flower-pot. This throws up the back rows, and shows off the whole of the flowers to the best advantage. See that the proper card is left face downwards by the side or in front of the box, give one last look round to see that all is right, and by this time the official request that we should clear out will have become too pressing to be resisted.

For the next hour we are left very much to our own devices, and a very anxious, nervous time it is, and the best thing I find is to hunt out the refreshments and endeavour to calm our excitability by the squarest meal that can be procured. We shall probably be able to do justice to it, as one's breakfast on show days is not generally of such a satisfying or substantial nature as it should be.

What an exciting rush it is into the hall directly the judges come out. I think these are the most anxious moments of all. We scamper round from box to box to see what has been our reward, with no thoughts just at the time for the success or failure of of others. Well, let us hope we find a "first," on each. It is a lovely feeling. But if on occasion we do not succeed, and we cannot all and always have first prizes, let it make us more dogged and determined to do better next year. "You never know your luck;" and I well remember the first time I exhibited, I got a third prize for my six. I was delighted, but when the first prize man was disqualified, for some malpractice or other—I forget what it was—and I was promoted to second prize, there was no holding me.

It seems to be the correct thing when unsuccessful to abuse the judges. They sometimes are not careful enough I think, and in judging Roses are too apt to let their fancy be influenced by the principles of avoirdupois rather than by slowly arriving at a decision by pointing each bloom separately, and thus make the total number of points for each exhibit represent the result; but this only occurs in local shows where the judges are called upon to adjudicate on a multitude of subjects in a restricted time; and even in glaring cases I have usually found it best to take the injustice "lying down."

Just one last word, little men fight keenly, and with the intense eagerness of little folk in another sphere of life. But in exhibiting our Roses—as indeed in all such competitions—let us endeavour to emulate the sweetness and brightness of our flowers in our feelings towards those who are struggling against us in what should be the pleasantest and most friendly of contests, where no bitterness or animosity should find a place, winning or losing with a good heart and cheerful spirit, and then we shall make amongst kindred souls who love the garden and the flowers we grow, friendships which will last us our life through, or if severed earlier, will yet leave us with memories sweeter and more fragrant even than the "fragrance of the Rose."

—G. W. Cook,

Roses for the Rock Garden.

[From "The Garden."]

IT is not because there is any dearth of subjects to plant in the rock garden that I venture to recommend Roses, but simply for the reason that some few varieties are seen to the best advantage when trailing gracefully over rockwork. At the base of the rockwork, those who know them can readily understand how exquisitely beautiful would be the tiny little Fairy Roses (R. Lawrenceana), with their exceedingly deminutive flowers no larger than a sixpence, or the more modern Polyantha Roses, of which Little Dot and Etoile d'Or would be most suitable by reason of their lowly growth. The stronger forms of this tribe, such as Perle d'Or, would be better adapted to plant midway upon the rockwork, and the same might be said of the ever-flowering White Pet, which produces immence corymbs of blossoms, each one like a miniature rosette. A sheltered, sunny nook should be reserved for that tender gem Berberifolia Hardii. Give it a little peat and protection in winter and spring, and it will be sure to flourish and yield plenty of its very transient but charming yellow flowers, which are prettily spotted at the base of each petal with chocolate. Another somewhat tender but beautiful Rose is the single white Macartney, that is well deserving of a place—if not on the rockwork, at least in some sunny spot of the garden, preferably at the foot of a warm wall. Its neat, shiny foliage is at all times interesting.

A rockwork is just the place for such quaint varieties as the green Rose. This curiosity is nothing more nor less that a redundant supply of calyx, the so-called flower being quite minus of petals. These calyces are pea green when opening, but change to a russet-brown shading as they develop. It is a true China Rose, producing these singular flowers in quite large bunches. Another pretty, if quaint, variety is the crested Moss, or, more properly, Provence Rose. Here the rose-coloured flowers are beautifully enveloped with a quantity of fringe, not unlike tiny Fern leaves. It is strong-growing, so should be placed accordingly. Two little gems for the rock garden are to be found in the miniature Provence de Meaux, both the pink and the white forms. It is a delightful little Rose of lowly growth, similar to de Meaux. Rosa microphylla rubra, unfortunately, is rather tender, otherwise it is a most interesting Rose. Two excellent kinds for the background are the fragrant Dawson Rose, now becoming well known, and its white sport. Rugosa Mrs. J. Waterer; bright crimson, the double flowers very freely produced; Austrian Briers, Single Copper and Single Yellow, the double Harrisoni, and the Stanwell Perpetual Scotch Rose, that well justifies its appellation of perpetual, are also very suitable. Hebe's Lip is a delightful single variety for the background, harmonising well with Macrantha perhaps the loveliest of all the singles. If the rock garden were sufficiently extensive room should be found for one or two of the Penzance Briers, such as Anne of Geierstein, the richest in colour, and Lady Penzance, the most beautiful of all, colour coppery orange. Rosa sinica Anemone is a first-rate novelty, said to be a hybrid of Rosa lævigata. One thing can be said in its favour, and that is it flowers freely on young plants. One cannot claim this much for Rosa lævigata. The flowers of Rosa sinica Anemone are single, and almost as large as those of Macrantha. In colour they remind one of the Hybrid Tea La Fraicheur. Possibly few individuals are aware of the rare beauty to be found in single varieties of Rosa indica. Let anyone procure a packet of Tea and China Rose seed, and he will obtain some delightful single varieties of quite enchanting colours that only require planting to gain for them admiration. I was much interested in one I saw growing at Kew last year, namely, Rosa indica diversifolia. Its pretty single carmine flowers were a relief from the double forms around. I have seen some of these single Teas and Chinas (that always predominate when a quantity of seed is sown) with flowers as prettily edged as a Picotee. Rosa Wichuriana and its very interesting hybridised seedlings open up visions of wonderous beauty in the near future, for it will be quite possible to completely envelop ugly mounds and banks with this tribe. The plants, running as they do along the ground, root like Ivy, and when once a specimen is procured it will be no difficult matter to obtain any quantity of rooted cuttings. Whether hybridising with the Tea-scented will affect their hardiness remains to be seen. It is said to be one of the newest kinds, Jersey Beauty, looks like a yellow Cherokee Rose. If so, and it flowers freely, it will be a decided gain.

PHILOMEL.

The Blue Rose.

Mr. M'Donald, an American rosarian, has just brought to England a horticultural curiosity in the shape of a blue rose, of which he is himself the cultivator. Extreme precautions were taken to protect it from perils of the sea and salt water, etc., and to keep it fresh and vigorous, it being protected in a specially fitted, beautifully-worked miniature greenhouse, something like a bird cage in shape. As a result, on arriving in Liverpool the buds were found to be in splendid condition. Mr. M'Donald will exhibit the specimen at one of the great forthcoming horticultural shows, and expects to "make a pile" by its introduction into the gardens of England and Europe. It will no doubt, have a welcome from lovers of the curious, but it is exceedingly questionable whether a blue rose cut off, as it must be, from all the pleasant sentiment that surrounds its kind, will win for itself any wide spread favour. Indeed from that point one wonders whether a blue rose is a rose at all.

* * *

Mrs. Kendal loves Roses best, and Lilie of the Valley next.

Mr. Edwards's favourite flowers areeth Violet and the Primrose.

Letters From the States.

New South Wales Notes.

[From our own Correspondent.]

Sydney.

The usual monthly meeting of the Horticultural Society was productive of an exceptionally fine display of exhibits. The Roses were much admired, and, notwithstanding the heavy rains of the preceding days, were really first class. The Roses shown by Mr. A. Tymms, of Gladesville Hospital, were awarded first prize, and were without doubt the finest in the room. This exhibit included La France, Glorie Lyonaise, Madam Jules Grolez, Madam Haste, Prince Camille de Rohan, The Bride, Rainbow, Captain Christy, Belle Siebrecht, Kaiserine A. Victoria, Maman Cochet, and Henri Maynadier. A specimen of a new variety—Mrs. E. Mawley—exhibited in Mr. J. Horton's collection received a lot of attention. It is a fine flower of a rich salmon rose colour, and of good shape.

Mr. T. Nicol exhibited a bloom of Victoria regia (Nymphœa). The natural habitat of this plant is the Amazon River, South America. It is not unusual for each matured leaf to measure 21 ft. in circumference and about 7 ft. in diameter. Amongst its pecularities may be mentioned that each leaf is turned up at the edges for about 2 inches all round, giving it the appearance of a large, shallow frying-pan, and it will be found that upon turning over the leaf its under surface is covered with thorns. It is stated on authority that each leaf will support a child three (3) or four (4) years old. The flower begins to open at about 6 p.m., and by 7 p.m. is fully expanded. It is then pure white in colour, and gives off a delightful perfume during the night. It closes up at the approach of morning, but again opens the succeeding evening. On this occasion it is of a heliotrope colour. This flower received everyone's attention and enquiry.

Another exhibit which received a lot of notice was a seedling Hippeastrum (Equestrian Star), shown by Mr. H. H. B. Bradley. It was of a rich self red colour with white stripe. It was a beauty, and many gardeners present expressed the opinion that it was the finest they had seen.

An exhibit that attracted me was an Orchid, "Brassavola Digbyana," shown by Mr. Nicol. This Orchid is one of the parents used in the production of the new Hybrid "King Edward."

A Cactus, "Epiphyllum Russelianum superbum," was much admired The specimen was very fine, the flowers of a delicate rose pink colour. It was shown by Mr. J. Yorke, and obtained a first prize.

A few trays of Pansies were shown of good form and colour.

The hat-trimming prize was awarded to Mrs. Jones, whose hat was very artistic.

Just now our florists are making fine window displays with Lilacs, Tulips, and Peonies, but of course it is well known that the first and last will not thrive very well in Sydney, although I have seen some first-class blooms at our Botanic Gardens during the past few years. The supplies are nearly always drawn from our country gardens.

The following is the list of prize-winners at the Horticultural Society's meeting last month:—

A Division.

Twelve Miscellaneous—Mrs. W. Sayers, 1; T. Nicol, 2; J. H. Horton, 3.

Twelve Roses—A. Tymms, 1; G. Kershaw, 2.

Twelve Annuals—J. H. Horton, 1; H. H. B. Bradley, 2.

B. Division.

Six Miscellaneous—Mrs. Drummond, 1; N. Marks, 2.

Six Roses—Mrs. Drummond, 1; J. Musgrove, 2.

Six Annuals—Mrs. Drummond, 1; N. Marks, 2.

C. Division.

Hat-trimming—Mrs. Jones, 1; Mrs. Horton, 2; Mrs. Drummond, 3.

Pot Plant—J. Yorke, 1; T. Nicol, 2.

Twelve Pansies—H. H. B. Bradley, 1; C. Gosper, 2.

Non-competitive—A. Tymms, collection of Shirley Poppies (very highly commended). C. Gosper, two Orchids (very highly commended).

Horticultural Society of New South Wales.

The annual Rose Show was held in the Concert Hall of the Queen Victoria Markets on Wednesday, 22nd instant. There has not been a finer collection of blooms for some years past, and the attendance of the public was very large. Amongst the flowers attracting the most attention were specimens of the recently introduced Hybrid Teas—Gladys Harkness, Bessie Brown, Corallina, and Baldwin. The first-named is after the shape of La France, of a beautiful rosy pink color, with large incurved petals. Bessie Brown is of a white blush color, and splendidly shaped. I picked out as being exceptionally good blooms of K. A. Victoria, M. Neil, Dr. Rushpler, Gloire de Exposition de Bruxelles (remarkably dark Rose), Muriel Graham, Queen of Queens, Souvenir de Madame Metral, The Bride, Paul Dupuy, Earl of Dufferin, La France, Madame Gabrielle Liuzet, Prince Camille de Rohan, and Maman Cochet. Mr. G. Kershaw was the most successful exhibitor in this class, carrying off no less than five first prizes with excellent exhibits. Other gardeners who tabled excellent blooms were H. Ferguson, P. E. Ewington, Mrs. Drummond, E. P. Morris, and A. J. Tymms. The judges had really a difficult task to allot the places. Mrs. Drummond gained "The

Champion Rose" prize with an excellent specimen of the Earl of Dufferin, but it was the opinion of many that several ran her exhibit very close, especially Mr. Ewington's Paul Dupuy. Too much praise cannot be given to the "Decorative Rose" exhibits, which were especially admired by the ladies. To my mind, the specimens of Ma Capucine, Carmine Pillar, Beaute Inconstante (Mr. H. Ferguson), Roger Lambelle, Austrian Copper Briar, Bonton d'or (G. Kershaw) were excellent. This class of Rose is attracting plenty of attention from our gardeners.

Some good orchids were shown by Mr. T. Nicol, gardener to Mr. H. Dixon. Two deserving special mention were Dendrobium atraviolaceum (New Guinea) and Cattleya citrina (Mexico). The flower of the latter has a drooping habit, fine yellow color, and possesses a pleasant perfume.

The Hippeastrums of Mr. H. H. Bradley were excellent, both as regards color and size; some of them the finest I have seen.

The Sweet Peas of Mr. W. H. Hatcher were awarded first prize in competition with a collection of first-class exhibits.

In Mrs. Sayers' collection of miscellaneous, I noticed a beautiful Lilium rubrum vittatum. It was an early bloom, but without a blemish. In this section were also specimens of Gerbera Jamisonii (Cape Daisy), and of Alstromeria alba. These were very pretty and attractive.

Mr. Gosper's Pansies were very good, notwithstanding the season.

Although there were only a few exhibits of Carnations, the flowers were excellent.

A striking non-competitive exhibit was a very simple but artistic table decoration arranged by Mr. T. Nicol. It was very highly commended. This exhibitor was also praised for a floral crown of Roses.

Mrs. Jones scored several first prizes for floral work. Her bridal bouquet was the centre of attraction for the gentler sex. It was made up of Water Lilies, White Lilac, Watsonia O'Brienii, White Carnations, Lilies of the Valley and Philadelphus. It was easily first. This lady's table decoration, in which Sweet Peas were used with much artistic effect, was also awarded first prize.

The following is the list of prize-winners:

Six Pot Plants, suitable for table decoration—1, J. Toyer; 2, G. E. Bragg. 36 Roses—1, G. Kershaw; 2, A. J. Tymms; 3, H. J. Ferguson. 24 Roses—1, G. Kershaw; 2, H. Gazzard; 3, G. Knight. 12 Roses—1. N. C. Lockyer; 2, H. Gazzard; 3, H. J. Ferguson. 6 Roses—1, H. Gazzard; 2, G. Kershaw. 6 Roses, dark—1, G. Kershaw; 2, G. E. Bragg. 6 Roses, light—1, G. Knight. 6 Roses, all one variety—1, G. Kershaw; 2, N. G. Lockyer and G. Knight, equal. 6 Pelargoniums—1, G. E. Bragg. 12 Carnations, not Marguerites—1, W. C. Fripp; 2, H. Gazzard; 3, G. E. Bragg. 6 Carnations, not Marguerites—1, W. C. Fripp; 2, G. E. Bragg. 6 Bouvardias—1, H. Gazzard. 12 miscellaneous, outdoor—1, Mrs. Sayers; 2, R. Forsyth; 3, H. H. B. Bradley. 6 miscellaneous, indoor—1, Hugh Dixon (T. Nicol, gardener). 12 Bulbous, not necessarily distinct—1, H. H. B. Bradley; 2, G. E. Bragg. 12 Gladiolus—1, G. E. Bragg. 12 Pansies—1, H. H. Bradley. 12 Sweet Peas—1, W. H. Hatcher; 2, Miss G. A. Gates; 3, A. J. Tymms. 12 Roses, Section B—1, E. P. Morris; 2, E. P. Ewington; 3, A. W. Fleming. 6 Roses—W. M. Musgrove. 3 Roses, dark—A. W. Fleming. 3 Roses, light—W. Musgrove. 3 Roses, all one variety—A. W. Fleming. 3 Pelargoniums—M. Marks, second prize only. 6 Carnations, not Marguerites—W. Musgrove. 3 Carnations, not Marguerites—W. Musgrove. 6 miscellaneous, ourdoor — Mrs. Drummond. 3 miscellaneous, indoor—C. T. Gosper. 6 Annuals and Biennials—Mrs. Drummond. 6 Bulbous, not necessarily distinct—Mrs. Drummond. 12 Pansies—C. Gosper. 6 Sweet Peas—B. Haigh. 12 varieties decorative Roses—1, G. Kershaw; 2, H. J. Ferguson; 3, A. J. Tymms. 12 Roses, in sets of three each—1, J. Roberts; 2, R. Forsyth; 3, W. Musgrove. Section D: 2 dress sprays—1, Miss Gates; 2, Mrs. Horton; 3, Mrs. Jones. 2 buttonhole bouquets—1, Mrs. Jones; 2, Mrs. Drummond and Miss L. Gates equal. Best arrangement in Sweet Peas, to cover a space not exceeding 4 x 3—1, Mrs. Jones; 2, Mrs. Horton; 3, B. Haigh. Bridal bouquet—1, Mrs. Jones; 2, Mrs. Drummond. Vegetables, 3 varieties—M. Marks.

South Australia.

[From our own Correspondent.]

Adelaide.

The Flower Show of the year was held on October 30 in the Adelaide Town Hall, and the Royal Horticultural Society is to be congratulated upon one of the very best exhibitions of flowers that could be got together. October is the month above all others for flowers in South Australia, and in spite of the bad weathering of the crucial days before the show, the Roses stood well. The Society, however, would do well to fix the time a week earlier, to suit the growers on the plains.

There are two palpable results regarding the show of Roses which the Society might with fairness alter. One is the fact that growers on the plains cannot successfully compete with growers in the hills, and, therefore, separate classes for these should be arranged. The second is that any exhibit of such a number as forty-eight Roses is almost necessarily spoiled of its standard of excellence by inferior blooms. A marked feature of all the exhibits in this class was the back line of inferior blooms the whole length of the staging.

An improvement in the staging by some exhibitors was noticeable in the adoption of the boxes of a similar pattern to those in vogue at the National Rose Society of England. No doubt the vases carrying as much of the foliage of the Rose as convenient is the nearest approach to Nature that can be had at a show, and the first and second prizes in this class, won by Mr. Smith and Mr. H. Kemp, demonstrated this. It is almost invidious to pick out special beauties in this class, but Louise Wood, Marie Van Houtte, and Francois Araga could not miss the eye in Mr. Smith's collection; while in Mr. Kemp's twelve the White Mamen Cochet, Ellen Willmott, and Mrs. Lippiatt were beautiful blooms.

The exhibit that attracted as much admiration as any was Mr. A. H. Scarfe's six of Marechal Neil. They were superb. The first prize exhibits in three, six, and twelve blooms were all good from the hills garden of Mr. Smith. Amongst these, special note was taken of Mrs. J. Laing, Pete de Lyon, Earl of Dufferin, Souv. de Mad. Jos. Mitral, Cloth of Gold, Catherine Mermet, Ernest Metz, and Francois Drago.

Mr. Kemp's twelve decorative Roses were good, the little Euphrosyne holding its own with the massive yellow Billiard and Barr. If one could possibly fix upon the best exhibit in the show it might be the group of twenty-four staged by Mr. Smith.

Other flowers that created much admiration were the pot plants in Pelargoniums, Calceolarias, and a magnificent specimen of White Azalea, exhibited by Mr. H. Sewell, who also carried off a great number of prizes for cut flowers. The orchids from C. F. Newman & Son's were perfectly charming, while their decorative art in bouquets and designs were objects of delight.

The table decoration, with the delicately tinted Shirley Poppies and Begonias, set in light ferns and wild oats, was artistic to a degree. The second prize with orchid blooms was pretty, as were, in fact, all the other tables.

Mention should have been made of Mr. Ising's exhibit of six Carnations—Miss Arkwright, Heather Bell, Mrs. L. H. Diver, The Gift, Mrs. Eric Hambro, and Voltaire. These were most worthy. Mr. Cruickshank also staged a good exhibit of Gladiolus.

The following is a list of some of the principal prizetakers:

Roses.—18, H. A. Smith, 1; H. Kemp, 2. 24, H. A. Smith, 1; A. H. Scarfe and J. Lipman, 2 (tie). Hybrid perpetuals, 18 and 12, H. A. Smith, 1; J. Lipman, 2. 6, H. A. Smith, 1; W. J. Smith, 2. 3, J. Lipman, 1; H. A. Smith, 2. Not hybrid perpetuals, 24, H. A. Smith, 1; J. Lipman, 2. 12, H. A. Smith, 1; A. H. Scarfe, 2. 6, H. A. Smith, 1; H. M. Giles, 2. 3, H. M. Giles, 1; C. A. Halliday, 2. 1, C. A. Halliday, 1. Any one variety, 6, A. H. Scarfe, 1; H. A. Smith, 2. Rose buds, three of each variety, 6, Mrs. W. Thomas, 1; E. A. Colbey, 2. 3, H. Kemp, 1; E. A. Colbey, 2. Garden or decorative Roses, three cuts of each, 12, H. Kemp, 1; E. Gries, 2. 6, W. Harris, 1; E. Gries, 2. 3, W. Harris, 1. Roses in vases, 12 distinct varieties, each one bud, one full rose, and own foliage (special prizes), H. A. Smith, 1; H. Kemp, 2. Amateurs—12 and 6, J. Lipman, 1; E. A. Colbey, 2. 3, G. Tucker, 1; Mrs. W. Thomas, 2; 1, Mrs. W. Thomas.

Cut Flowers.—Anstirrhinums, H. M. Giles, G. Smith. Carnations, H. H. Ising, J. H. McInnes, Mrs. W. Thomas, E. Hall, J. J. Gabb. Picotees, J. H. McInnes. Pinks, D. Cruickshank, J. H. McInnes. Sweetwilliams, J. J. Gabb, J. H. McInnes. Dianthus, double, J. Lipman, W. Collins; single, J. J. Gabb, Mrs. W. Thomas. Ericas, C. A. Halliday, H. Sewell, G. Smith. Gladiolus, W. H. Shaw, D. Cruickshank, J. H. McInnes, E. Gries. Iris, J. H. McInnes, E. Gries. Orchids, C. F. Newman & Son, H. Sewell. Pansies, C. A. Halliday, J. McInnes, E. A. Colbey. Pelargoniums, H. Sewell, W. J. Smith, Mrs. W. Thomas, W. H. Ind. Penstenions, W. H. Shaw. Petunias, H. Sewell, W. Collins, D. Cruickshank, J. H. McInnes. Phlox, E. Gries, B. P. Mitchell. Verbenas, J. H. McInnes, C. A. Halliday, J. J. Gabb. Bulbous or Tuberous, C. F. Newman and Son, J. J. Gabb. Climbers, C. F. Newman & Son, E. Gries. Annuals, W. Harris, J. J. Gabb, J. H. McInnes. Stocks, J. Lipman, J. H. McInnes. Shrubs, C. F. Newman & Son, H. Sewell Cinerarias, J. Lipman. Sweet Peas, E. Hall, H. H. Ising, W. Harris. Poppies, J. Lipman, J. J. Gabb, G. Smith.

Plants in Pots.—New or rare, H. Sewell, C. F. Newman. Pelargoniums, show, fancy, and regal, H. Sewell, W. J. Smith. Zonale, W. H. Ind, W.

J. Smith, H. Sewell, D. Cruickshank. Tricolor, W. Harris, W. H. Shard. Bicolor, W. Harris, H. Sewell. Petunias, H. Sewell, W. H. Shard, D. Cruickshank. Calceolarias, T. E. Barr Smith. Bulbous or Tuberous, C. F. Newman & Son. Orchids, C. F. Newman & Son, H. Sewell. Mimulus, W. Harris. Ericas, C. F. Newman and Son, H. Sewell. Azaleas, C. F. Newman & Son, H. Sewell. Climbing and Ornamental plant, C. F. Newman & Son, H. Sewell. Coleus, H. Sewell, Mrs. W. Thomas. Ferns, C. F. Newman and Son, H. Sewell. Variegated Plants, C. F. Newman & Son, H. Sewell. Lycopods, C. F. Newman & Son, E. Gries. The honours for various decorative and ornamental plants were divided amongst C. F. Newman & Son, H. Sewell, H. G. H. Piening, W. Harris, and E. Gries.

Bouquets, Designs, &c.—C. F. Newman & Son, T. W. Babbage, B. P. Mitchell, W. H. Ind, Decorated Dinner Tables, Mrs. Ind, 1; Mrs. Wilson, 2; Miss Long, 3.

Fruits.—C. Pitt, J. Hobbs, W. H. Ind, T. B. Robson, G. Tucker, W. G. Lewcock & Sons, Mrs. W. Thomas, J. Lipman, W. Hackett.

Vegetables.—C. A. Halliday, T. B. Robson. J. J. Gabb, J. Lipman, J. E. Rowell, Mrs. W. Thomas, W. G. Lewcock & Sons, and E. A. Colbey.

The effects of the spring growth of September have been demonstrated this month at shows held throughout the length and breadth of the State. In nearly all the country displays the effect of the dry season was very apparent. In the suburban area, however, some excellent exhibitions have been held, in spite of the unusual changeable character of the weather and the prevalence of insect pests. It cannot be said that they surpass the corresponding events of last year. Suburban shows were held at

Norwood, where most of the honors were divided amongst Messrs. E. A. Tolley, B. F. Mitchell, W. Wakeham, E. J. Le Page, E. Hall, and A. L. Benda. Mr. J. Beggs had a fine display of cut carnations, which were not for competition. His best specimen was Mrs. W. T. Lawson.

Hindmarsh.—Messrs. W. H. Brooker, H. G. H. Penning, J. Bennett, H. M. Radcliffe, and G. Tamlin.

Port Adelaide.—Messrs. F. J. Rawlings (champion Rose), F. Fairey (champion Pansy), S. D. Walker, G. Williams, W. H. Westlake, C. H. Johnson, J. C. Catt, and H. L. Adams.

Unley.—Mr. A. H. Scarfe secured most of the honors for Roses, including champion prize for a splendid specimen of La France. Other winners were Messrs. H. Kemp, W. H. Shaw, Mesdames Lipman, Thomas, and Harris.

Goodwood.—Messrs. W. Collins, H. Eland, J. H. McInnes, W. Rowland, and G. Holden.

Amongst the many country shows were those held at

Mount Gambier, where the chief prizetakers were Messrs. G. Sturtzel, C. Goss, A. Loutit, Moorok and Benara Estates.

Moonta.—Messrs. Blee and Cock, W. H. Mitchell, Buston, and Fuss, Lashbrook Brothers, and W. H. M. Williams.

Wilmington.—Messrs. Pickering & Co., J. H. Buchanan, C. H. Tuckwell, Mesdames Shepherdson, Holthouse, and Pavy.

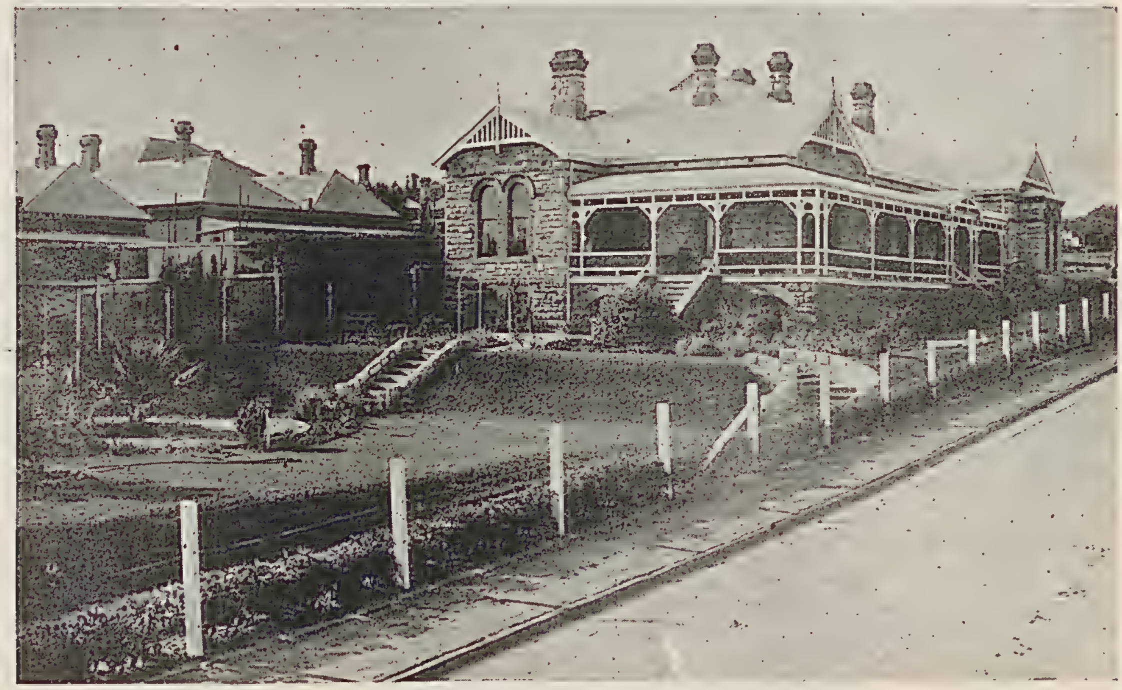
Jamestown.—Messrs. Mitchell, Lewcock and Sons, T. C. Gordon, and Miss A. Mitchell, Messrs. F. Parmington and G. H. Stanton secured most of the prizes for vegetables.

Maitland.—Messrs. J. O. Tiddy, W. Milhinch, James, and Holland, A. Jarrett, Mesdames Adams, Nancarrow, Whitelaw, and Miss Bell.

Salisbury.—Messrs. J. B. Laurie, Swann, G. and D. Hooper.

* * *

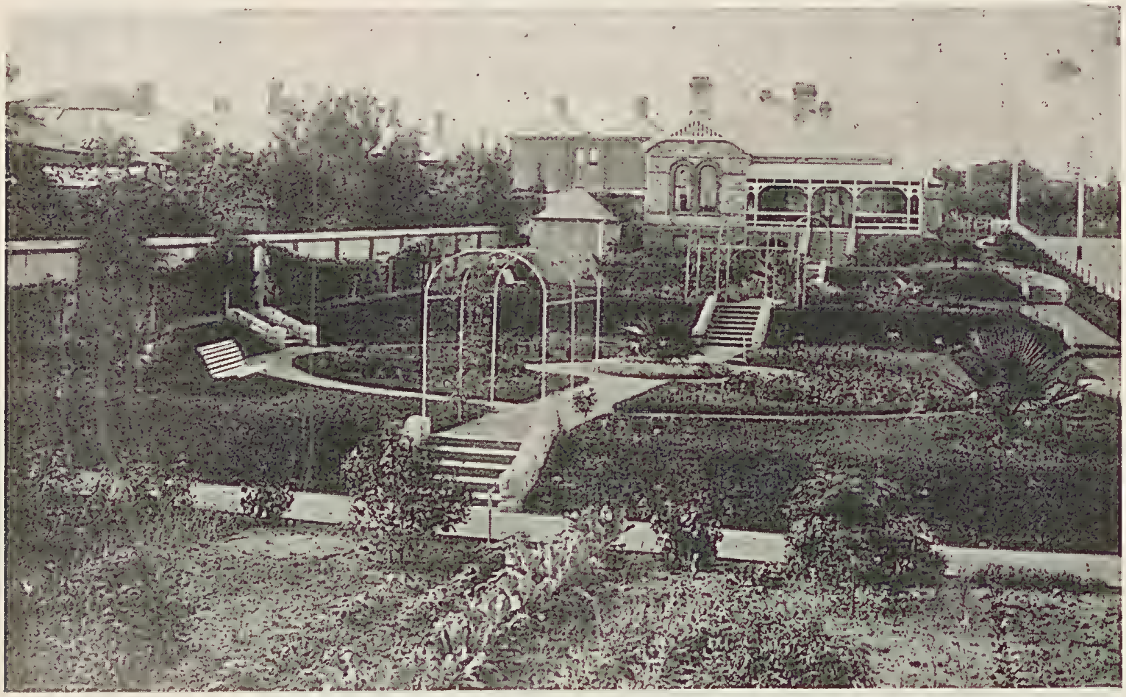
RANFURLY.



The Residence of Mr. William Kuhnel.

THE residence of Mr. William Kuhnel, at Brougham Place, North Adelaide, is a type of the ever increasing number of suburban residences to the City of Adelaide. With the architecture of the building we have little to do other than to say that it is quite in keeping with the up-to-date style of villa that looks good, commodious, and substantial. The site is upon the slope of the North Adelaide hill looking towards the city. Bagot Street, which runs down the whole length of the property, is now a pretty and short cut via the Oval to the heart of the city. Our special reason for introducing the garden at "Ranfurly" to our readers is by way of illustration to show what a single season can do in transforming a piece of waste ground, or, to be more correct, a piece of ground lying waste, into a garden of real beauty. About eighteen months ago this ground carried an old-time cottage, with marsh mallows, weeds knee deep, with all the residue of stable litter, kitchen waste, tins, and all the habiliments of a rubbish tip. Now, in this incredible short space of time, by the appointments of skill and artistic taste we see a splendid house surrounded and terraced with a delightful garden, where the people passing by cast lingering looks of pleasure. Now just here is where we can introduce the typical Australian characteristic of liberty and freedom, which made a happy combination with the strain of German hospitality. Both faculties are strongly developed in

Mr. Kuhnel, his wife, and even amongst the children it is noticeable at a tender age. The fences which divide this beautiful garden from the roads on both sides are made of posts and wire. Why didn't you have a galvanized iron 6-feet fence around the place to keep out the rude gaze of the people passing by?" "Why?" said Mr. Khunel. "Why shouldn't they gaze in if they want to. If it gives them any pleasure, let them look by all means." An ounce of that kind of hospitality is worth a ton of the greedy selfishness which appears to have been introduced into these young lands years ago by some who would have served the country as well by staying away. While we admire this characteristic of "Ranfurly" we are bound to admit that for the protection of his garden treasures from the north and north-east winds he should allow his hedges to grow as high as his hospitable conscience can possibly allow them.



Ranfurly.—Full view of the Garden and Residence of Mr. William Khunel.

For the very short time that it has been planted the hedge running down the fence the whole length of the ground, about 125 yards at a rough guess, has made a fine growth, and shows that gardeners who require a quick-growing hedge should plant Pittosporum undulatum. The foliage is large, fairly compact, and graceful, making a good background to bordering of annuals. Here the gardener has set out a long line of Sunflowers and Chrysanthemums, which will make a gorgeous display in summer.

The front elevation of the house carries a balcony overlooking the garden below on the slope to the bottom of the hill. This of necessity requires the back of the house to face the main road which runs round Brougham-place Square. The skill of the architect, however, has so arranged the back of the house to present a good appearance, with large windows from the billiard-room looking out onto the two semi-circular lawns. A Pittosporum hedge will very soon give a good backing to these lawns and to the flower beds that have been inserted about a foot in from the edge, and planted with the choicest Roses in such a way as to give the best effect to the sloping position. At each corner of the ground is an entrance gate, and an archway of white and yellow Banksias give an opening to the western side, while on the eastern side is a complimentary arch of Marechal Neil and Devoniensis. Following this pathway round the garden plots at the rear of the house we notice amongst the Palms and shrubs Jusbitia Alba, Abutillon, Tecoma Smithi, Veronica, and Abrothamnus, with Roses and annuals of a good selection. This part of the garden is very tastefully laid, and the buffalo grass looks even and strong.

The pathway leading to the eide of the house, where the main entrance is, takes the fashion of graceful scroll curves, artistically designed. The bedding at the side nearest the fence contains another choice selection of Roses, and in addition to the Chrysanthemums a number of good Carnations give good colouring. The edging looks pretty and gay with the petite little Vireinia stocks. Hard by the palm facing the entrance steps, is an Erythrina (coral tree), which should give a splendid appearance to the place in a few years. The bedding at the corner of the house carries a profusion of flowers, together with not too many shrubs to crowd it. Here we note Cantera dependeus alba, Diosma, a variety of shrub like a Buddleia, and Escallonia rubra. Still on the south-eastern corner is another bed of Roses, and rich Pansies, Stocks, and Carnations, with Goodetia to come. An archway with a nameless but good flowering red Rose connects this bed with a large semicircle garden plot, set out with Geraniums, Pentstemons, Carnations, Roses, Gladiolus, and Dahlias just ready to peep through the ground.

To this point in the ground the slope has been banked up to a flat, making the first terrace A few steps lead the way on to the second terrace, the sloping bank being covered with a mat of buffalo grass. Here we are introduced to a geometrical form of garden plotting. The paths all round the centre palm circle look well, and the straight beds on each side give plenty of room for shrubs, grass, and any quantity of flowers. The northern corner carries a shadehouse, while the other three have palms (Pritchardi filamentosa) of good growth. Along the edging of the grass on the western plot we note annuals in the front row, with Gladiolus in the centre, and a collection of Chrysanthemums to back them up. The same strain of Gladiolus are set along the border of the plot opposite, and one or two in bloom show that the German strain is good. Here, also, are a set of Antirrhinums, Goodetia, with Iberis and a number of summer annuals to come. Among the Roses here in bloom are Devoniensis, Miss Ethel Brownlow, Safrano, Beaute Inconstant, Reive Marie Henriette, Kaiserin Augusta Victoria, Belle Sedrecht, Prince Camille de Rohan, and Cecile Brownlow. A good selection, doing wonderfully well for one season's growth. In the centre of the pathway is a happy design of trellis and archway to carry an Asparagas fern and a Souvenir de la Maison rose.

Passing under this, which, by the way, was built for a shorter man than your representative, we take a few steps down to the third terrace or flat. Here again is a centre Palm, with a surrounding geometrical radius giving an inner and an outer circular pathway, with cross paths leading into each. The Palm centre is massed in a bed of white Pinks, which are very effective. Looking from the centre to the western plot we see the Ranunculus and the Narcissus neatly tied up after their blooming, while the annual Chrysanthemums still show their variegated colours. The Roses are in their prime of beauty, and the carefully laid soil covers the Dahlias which are to be. The bed opposite is a counterpart of this with the addition of a shade of blue from the Cornflowers. Turning to the opposite corner we find an array of Chrysanthemums, with little peeps of blue from the modest and dainty little annual Forget-me-nots. Goodetia are coming strong for present blooming, and in the centre is a vigorous plant of Hibiscus splendeus. Yet again on the fourth plot we find the same order of things. The inner edging of these four plots is of Pyrethrum, looking as neat as order can make it, giving a pleasing variety of light foliage against the predominating dark green of the buffalo grass. The two upper grass corners filling up the square are centred with Orange trees, while the tower complementary corners are set off with Palms. It is rather a pity, by the way, that all the Palms in the garden should be of one variety. Half-a-dozen others would look equally well and lend a greater charm to the general effect.

Looking from this elevation across to the stabling and yard at the extreme end of the grounds we see a well-furnished kitchen garden of toothsome comestibles, looking fresh and appetising, the sweet, young, raw turnips being, we notice, an undeniable temptation, as they always are, strange to say, to the children, one of whom was affectionately negotiating one of these indigestible stolen sweets.

Passing across the lower footpath to the sloping walk which runs straight down the western side, we find that an effort is being made to cover the great dividing galvanized iron fence. In view of the forest growth of trees overlooking this fence the task of covering it with creepers from the garden side is no easy matter. The subsoil is no doubt robbed of all its nurture by a mass of roots to support the growth of trees; but many of the creepers are making a gay effort, and amongst them we notice a selection of the Kennedyas, Clematis, Jasmine, and Passiflora Constance Elliot. A brick wall of a building is being utilized to display the climbing fig (Ficus stipulata), which will take some time before its leaves spread the superficial area, but will repay all attention. Further up the slope we note the Banksias, Bougainvilleas, Cobea scandeus, Salanum Jasminoides, Stephanotis, and Rhincospermum.

Here our ramble round the garden comes to an end, and we have just further to remark that we could hardly have believed it possible that within the limits of practically one season such a complete transformation scene were possible. All the paths are beautifully kept, and this in itself is no mean undertaking, for they must represent a good many yards of work to cover. Not a weed is to be seen about the place, everything is neat and clean, with a choice collection of growth, which, going on at its present rate, will in a very few seasons make "Ranfurly" rank amongst some of the best flower gardens of North Adelaide, which is saying a good deal. We congratulate Mr. Carter, the gardener, whose testimonials from some of the royal gardens of England give the key to the secret of Mr. Kuhnel's pretty estate.

The Orchard.

[By "Hawthorn."]

The arrangement of soil surfaces should be seriously engaging the attention of fruit-growers at the present season, the object being to keep the land clean, sweet, and moist. Cultural methods naturally depend on the nature of the soil, the character of the tree, and the class of growth it is desirable to promote. Close and open, hot and cold, dry and moist, deep and shallow soils all call for different treatment. The warm weather and heavy rains that have alternately prevailed will have the effect of stimulating root action, and will probably result in growth of a strong woody character. This will be an advantage in the case of young or weakly trees, but where weakness rather than strength is required in a tree in order to make it fruitful it may be necessary to cultivate the soil in such a manner as to cause it to dry out somewhat. Dryness will impose a check on the root and will lead to the production of weaker and more fruitful wood.

Many of the orchard trees have now arrived at a critical stage of their development. The unfolding of the leaf and flower is now proceeding. This process is materially assisted by the slow and gradual ascent of the sap. Any excess of moisture at the roots at this period would have the effect of sending up a quantity of crude sap to the head of the tree, already supplied with a sufficiency of elaborated sap, and would upset its balance. The object in cultivating therefore is to keep up a gradual supply of elaborated sap only. To enable the tree to set its fruit the soil must be kept sweet, warm, and open, and when the storing and seed-growing stage is reached growth must practically stop. Faulty cultivation would result in malformation or abortion. After the fruit is well formed a period of active growth ensues, and the tree should be cultivated to enable it to sustain a healthy growth.

Great care must be taken in dealing with young fruit trees to keep the soil sweet, especially if there is a tendency to excessive moisture and a low temperature, the roots are very near the surface and upon them the head of the tree largely depends for food. We wish to ensure a strong, free growth in young trees.

Towards the end of the month, or even earlier in dry districts, it will be advisable to mulch so that all available moisture may be stored up for future use. Weeds and litter of every description, provided it is clean can be utilised for this purpose. Trees that have been recently grafted or budded will require attention from time to time, to have their ties loosened and superfluous growth removed. It is advisable to allow more shoots than are actually required to remain to act as a screen, and also to take the place of others that may be accidently injured. All suckers should be promptly removed as they appear by severing them from the root as far as possible below the surface.

Trees that are found to be bark bound can now be lanced, as that operation can be performed after the sap has risen. It will have the effect of increasing the flow of sap, thus strengthening a weak tree and healing any wounds that may have been caused by gumming, accident or disease. The cuts should be made quite perpendicularly. Apples, plums, apricots, cherries, and pears may be dealt with in this manner.

With the approach of warmer weather the planting of citrus trees may be proceeded with, provided the land has been well and carefully prepared. Young trees must have a clean, loose, moist, sweet soil, as they require to make a free growth towards the latter end of summer. The situation must be carefully chosen. They must not be exposed to cold harsh winds, nor must they be protected to the exclusion of light and air, both of which are highly necessary to their heathly development. In a cool district they may be planted at a distance of from 18 to 24 feet apart.

The early spring affords an opportunity of directing the growth on young fruit trees, removing shoots in faulty positions, and selecting only those that will ensure the production of a shapely and profitable head. The energy of the sap must be well directed. If the trees are struggling in a poor soil give them a liberal mulch. Look to the stakes and see that they are firmly secured.

Young and weakly trees will benefit by their trunks being bandaged as a protection from the sun. The bandages, however, must not be allowed to go too long without inspection, as thay offer a lodgment for parasites. Most insects renew their activity at this season. The first and wisest precaution is to keep the trees in a condition to resist their ravages. Every tree should be given the fullest opportunity of preserving itself in health. It is too often due to the exclusion of light and air that they become weak and dirty, and a prey to insects and disease. See that all dead matter is removed, as it also is a fertile source of refuge for enemies. Peach trees are particularly liable to aphis and leaf curl when placed in damp, airless soils. Warmth and sweetness are essential to the health and vigour of a peach tree. Leaf curl if taken in time can be effectually combated with a spray of Bordeaux mixture, summer strength. Affected leaves should be removed and burnt. Aphis is a persistent pest, and will only yield to repeated sprayings with tobacco water and softsoap. Codlin Moth can be treated when the fruit is just set with Paris green, London purple, or kerosine emulsion. Red spider attacks apples, pears, and plums, and is very active in dry weather. A weak spray of Bordeaux mixture should be applied. Citrus trees that are affected with scale or fungus should be sprinkled with freshly slaked quicklime. This should be done after a fall of rain or whilst the dew is on the leaves.

The Orchard in Germany.

(Translated from "Die Gatenwelt.")

[By Teuton.]

Is it the right thing to do to cut newly planted fruit trees or not?

My esteemed reader will have heard probably frequently, also have seen, and read too, that people prefer in some localities, not to cut back newly planted fruit-trees at once, but to do this only one year after planting them. This would be perfectly right, if one would make reasonable use of the non-cutting. By cutting back we deprive the young tree of a part of its branches, and especially those parts on which you will find the best and most important buds for the new formation of the young growth for the coming year. The consequence is, that the leaf apparatus will be smaller, and also the leaves themselves. They grow from lower, weakly buds, consequently that part of the tree which is the greatest factor is reduced. But that is not all. With the cutting down of the branches the tree also loses the greater part of the so-called reserve sap, out of which the tree would be able to form the first labour apparatus, the leaves. Therefore it is only natural that newly planted trees, especially those on heavy, cold soil, where a quick support of newly introduced nourishment, in consequence of slow root activity, is not possible, will be in the greatest want of those parts which are rich in reserve sap, in order to bring forth strong leaves, which latter would act greatly in favour of the roots. When the strong leaves appear they will conduct the necessary building up material to the roots, which they themselves have acuired with the assistance of light and sunshine. Further, by many leaves the water and nourishment supply above will be considerably increased, which will not be possible with small foliage; therefore root and leaf extension goes on side by side. If the soil be loose and warm, such precaution will not be necessary, as in that a case the root formation will be more favourable. The sap stream from the roots to the leaves, for the nourishment of the latter will be stronger. But also in very loose soil where the ground soakage water standard is high, would it be advisable not to cut back at once? In the most favoured localities, where soil circumstances, condition, and kind of tree will make it admissible, one may cut back at once. These are the conditions of planting to which I would draw attention, but I must attach even a few remarks to those.

The greatest surprise was caused me by the actions of a fruit tree grower, and I am sure that my reader will agree with me that they were passing strange. This gentleman had in his garden, planted in the spring, pear and apple trees, which, as usual with him, would not be cut back. But hold on! It suddenly occured to him to graft one half of the trees, and that he set to do at once, and not wait till the next spring. And why? As for other trees, grafts would have to be ordered, he might just as well order those for the newly planted trees, to save the postage in the next year. Which is now right? On one side of the road you find the trees not cut back, on the other side, trees even highly improved by "trinagulation."

The grafting was deep set, so that not one eye remained; the wounds, which, were caused in so doing, were ever so much deeper than those of trees cut back. Why did the man not cut back the trees? Because he knew that they would become cripples. And why did he graft them? There only silence answers. Of course the grafts were completely crippled and have only growth of about 20 cm. in length.

Vine Laterals Management.

A little forethought in timing the laterals of vines so that there is a thin, but regular canopy over the bunches by the time the berries are stoned is always well repaid, for the most likely time for scorching of the berries is just when they are apparently stationary between the stoning and the second swelling. Old vines that have broken regularly for years will, as a rule, give far less trouble than younger canes, for these do not always break so regularly as is desirable, and there will in such cases be blank places in the roof unless means are taken to prevent it. As a rule an unfruitful lateral can be extended from the same or a neighbouring vine, and if not allowed to run too far and get thick, the increased leafage is an aid to the roots as well as a means of protection to adjoining bunches. But it does not do to wait till the Grapes are stoning; now is the time for allowing a little freedom to the mid-season and late Vines, for the lateral growth is never so brisk just when the berries are stoning as it is previously and after, a great deal of the force of the Vines being apparently concentrated upon the stoning process. Should anything have occured to make a blank space, such as the snapping out of a lateral on a strong Vine when it is too late to make up the deficiency, it may be well in the interest of adjoining bunches to shade this spot.

Regular attention to stopping and pinching as the season advances is of great aid in vinery management now. When the sub-laterals are allowed to ramble over and crowd their neighbours, they exclude light from the buds that are forming at the leaf bases, and not only this, but there comes a time when their wholesale removal is necessary, and this constitutes a severe check to the Vines and lets the sun in suddenly to where the leaves have not been exposed to its rays, and are not, therefore, hard enough to stand the light. I am not by any means in favour of cut and dried practice in any department of gardening, but it is far better to stop regularly at the first leaf than to let the growth run in the slipshod manner sometimes noted. Again varieties differ in their likes, and as a general thing it will be found that black varieties colour better under a rather thicker canopy of foliage than do white ones. But the tying back of the foliage from the latter still practised in some places is a plan I never liked. It is bad for the leaves so treated, and often results in burnt berries or a thick, cloudy coloured bunch.—*The Garden.*

VEGETABLE GARDEN.

What we desire above all things in vegetables is quality and flavour. Their lives are brief, and many of them have to perfect a large system in a very short space of time. They require liberal feeding and attention. At this season the hoe must be used freely. It is important that no weeds remain. Where the soil has been well ridged in winter it should now be in a sweet, warm, and mellow condition for spring cropping. The soil should be arranged to conserve moisture and to throw off heat. Advantage should be taken of the next rain to sow seeds of vegetables for summer and autumn use. During this month onions, carrots, parsnips, silver beet, turnips, radishes, and spinach can all be planted. Late tomatoes are ready for planting in a sheltered position.

Sow seeds of cucumbers, melons, marrows, and other squashes in the vegetable or fruit garden as desired. Were late spring frosts are still anticipated afford protection at night. Celery trenches can now be prepared, as the seeds can be sown this month. The trenches should run north and south, in some warm and shady position, and should be made 1 ft. wide and 1 ft. deep. The distance between the trenches should be about 4 ft., and can be occupied by a crop of lettuces. Lettuces require a well-manured, not too heavy, soil, a deep, rich, sandy loam. Seed can be sown thinly by broadcasting or in drills, and covered with fine soil. Endives require much the same soil and situation.

Sow radishes about once a fortnight for successional crops. Keep the soil moist and cool during dry, hot weather, to enable them to grow as quickly as possible.

Asparagas should now be yielding a full crop. Whilst they are still young cut sparingly from each stool. Do not cut asparagus to the extent of weakening the plant. Allow a certain number of stems to develop and carry on the natural work of the plant. Asparagus beds cannot be hoed for fear of damage to young shoots. Apply a dressing of salt. This will rid the bed of weeds and act as a manure to the plants.

Plant late potatoes now, and earth up those of the present crop that require it. Cauliflowers can also be planted now for use in autumn. Plant out Globe artichokes which have been obtained from the base of old plants or raised from seed. Give them a deep, well-prepared soil and plenty of moisture at their roots in summer.

Give rhubarb, artichokes, and all strong growing vegetables liberal supplies of liquid manure. It promotes growth, gives leaves a richer colour, and makes the plants larger and more luxuriant.

“The ❀ Australian ❀ Gardener.”

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A MONTHLY JOURNAL OF FLORICULTURE AND HORTICULTURE, FOR PROFESSIONAL, PRACTICAL, AND AMATEUR GARDENERS.

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Manager for the Proprietors of "The Australian Gardener,"
61, Brookman's Building,
Grenfell Street, Adelaide.

The Australian Gardener.

MONDAY, DECEMBER 1, 1902.

Editorial.

"THE AUSTRALIAN GARDENER" for December supplies its readers with a large amount of practical and interesting matter. Rose growers will find a deal of interesting information culled from the latest English files upon the new Roses at the great Annual Temple Rose Show in London.

The month of November is we believe, a record drought for the four weeks, and consequently extremely trying to the cottage gardener, who has to depend so much upon atmospheric condition for his flowers. The ill-effects of this early summer heat is shown everywhere, particularly amongst Roses on the plains.

A correspondent has sent us a letter upon "Ringing the Currant Vine," to which we would call the special attention of vinegrowers. This ancient system of doctoring trees and vines has of late been introduced into Australia, which is fast becoming a competitor in the markets of the old world. In South Australia particularly, we notice that attention is largely directed to the system of ringing, and we think a note of warning upon the matter at this time is seasonable. As our correspondent very properly emphasises, it is quality rather than quantity that our growers should consider. It is this disregard for quality that has handicapped the bulk of Australian exports into the London market for years. We cannot afford to send away inferior articles, and nothing diminishes our chances of successful competition in the markets so much as "doctored" products. The dealers in currants are fully alive to all the tricks of trade, and as this is one of the oldest, it is surely a suicidal policy to introduce it to Australians. Not only is it bad in trade, but it is bad for the growers, who will injure their vineyards within a very few years.

We feel again obliged to acknowledge indebtedness to our readers for their appreciative criticisms and offers of assistance to "The Australian Gardener."

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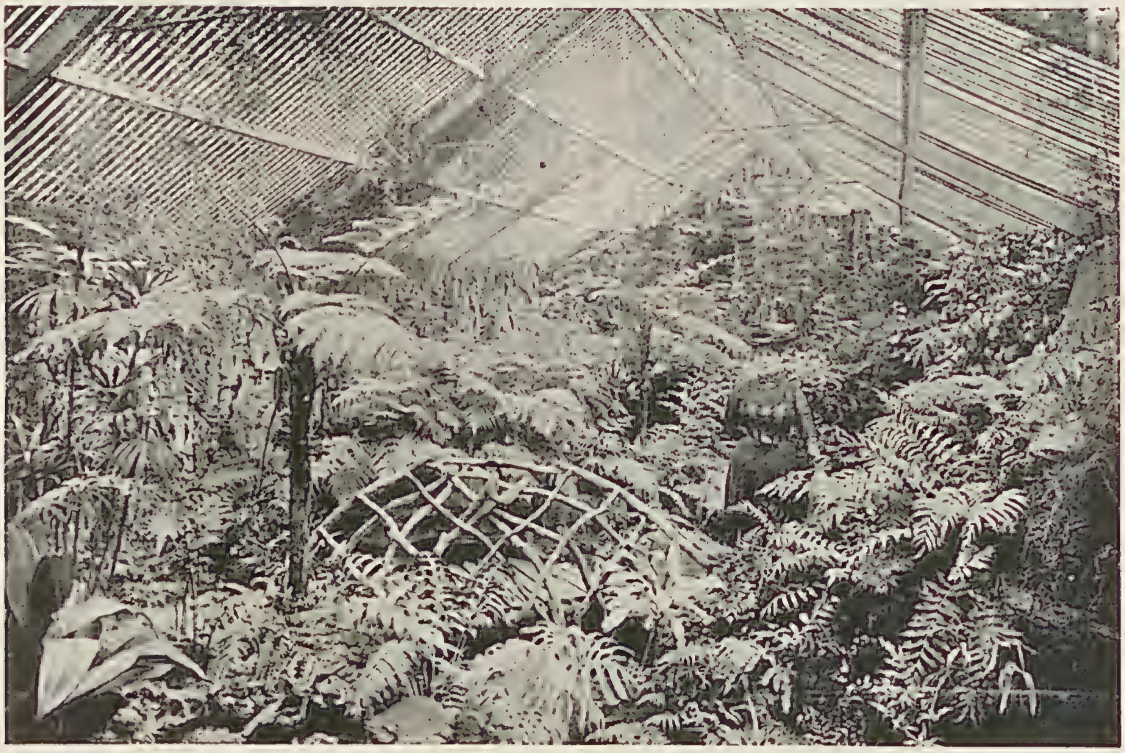

Fernery and Grotto at Montefiore, the residence of His Excellency the Right Hon. Chief Justice, Sir Samuel James Way, Bart.

The glasshouse, however, is a structure of the most approved type, imported from a famous firm in the business at Norwich, and erected here. It measures approximately 25 ft. by 12 ft., the sidelights about 3 ft. high to the wall plate. Span roofed, with top ventilators worked by screw apparatus from within. The shading of the glass is made of a mixture of whiting and skim milk, which gives a nice transparent film that will stand all weathers. To get the effect upon glass known as summer cloud, a little Brunswick green should be mixed with the composition. The door opens upon a clean tiled footway down the centre. The benches for the pot plants are tiered to about 4 ft. high. Over the doorway at each end is a fine piece of Platycerium grande and P. alcicorne (stag's horn and elk's horn—from platys, broad, and keras, a horn), the fronds of which measure some feet. These pieces of ornamentation are to be found in every fernery as being perhaps a type of grandeur and impressiveness. The general effect of the tiers is pleasing in its variety of color and form, the grace of the ferns and palms adding just the necessary touch of artistic ornamentation to the more dignified habit of the stiffer-growing foliage, while the hanging baskets prettily fill up the otherwise blank spaces of the house where the potted plants fail in height. Examining the plants a little more closely, we note on the right hand set of tiers, in the more shady aspect of the house, a number of Adiantums (Maidenhair ferns), without which it seems impossible to furnish a conservatory, Davalias (hare's foot fern), Fijiensis and plumosa being very good pots. In Draecinas, the specimen of Lindenii was showing finely distinctive variegation of foliage. The immense family of Begonias are, of course, represented, and although we should like to have seen more of these regal foliaged plants, we noted good specimens of the pink Rex and the deeper colored fuchsioides. Primulas and Cyclamens, too, had somewhat scant representation for a first-class house, the most prominent being the purple obconica and the yellow verticillata. Azaleas were there giving a rich coloring to the predominating shades of green. Epiphyllum was also there in good growth of the truncatum variety, and a specialty was noted in the variegated ivys. We were pleased to see the ivys, for the simple reasons that as decorative plants they are too much neglected. The variegated ivys here give quite an artistic blending of color and pleasing tracery to the surroundings. An ivy leaf Tropaeolum was very pretty and graceful.

Turning now to the left side of tiers, the Petunias of more or less beauty were ranged, together with Coleuses and Primulas. Some varieties of Orchids were there, the best perhaps being the Cypripedium (lady's slipper, from Venus and podion, a slipper), insigne, and barbatum. Here were also set out a good collection of zonal Pelargoniums, one snow white variety being nameless, but charming in its purity and shape. A few pots of Fuchsias show that this class is not quite neglected. Surprise was manifest at a number of Gloxinias in bloom. Mr. Cole explained that these out-of-season blooms were some very late ones of a batch of seedlings, the seeds of which were sown about November of last year. Some of the sowing bloomed in the autumn, and the remainder of apparently a different strain came later and threw some very fine blooms. A small tricolor Coleus made a pretty basket plant. A few palms completed the general list of beauties in the glasshouse, the best representatives being Kentia belmoreana and K. Forsteriana and a Macrozamia.

The Fernery and Grotto.

The eastern doorway of the glasshouse opens into the fernery, and as the door swings back the visitor hesitates to enter. The scene presented holds him in contemplation upon an imitative picture of Nature in her most fascinating beauty. One feels as it were suddenly transported to one of those sequestered little glens, which have given the Blue Mountains of New South Wales a reputation of romantic beauty. The mind involuntarily travels to such beauty spots as the Leura Falls, and lingers by one of the many little nooks where Nature in all the loveliness of her pristine beauty holds the visitor transfixed in admiration. It would seem that one of these little spots of beauty had been lifted bodily out of Nature's hiding places and dropped into Montefiore. It requires no great stretch of imagination to realise this, but rather has one to pinch himself to know that he is not dreaming. Certain it is that the scene before him recalls the stories of fairylands of childish memories, and of the ancients who peopled every woodland dell and stream with airy creatures. While the fancies of memory are thus actively engaged in the stories of long ago, or upon the actual beauties of mountain scenery, or recalling the poetic charm of Shakespeare'sNature studies, the voice of the gardener bids you enter. To him the daily avocation of planting and caring for the details of this little scene are prosaic enough, and he naturally wonders at one's contemplation. The little spell of reverie is broken, and you trespass upon the mountain footpath. Now, how to describe this rockery is much more difficult than to think about it. The pathway rises on the left to about 8 ft. high in a winding way of steps leading on to a rustic bridge crossing at an angle a miniature ravine. Upon this bridge our picture shows Lady Way, whose presence gives a living charm to the surroundings. From the vantage point of the bridge the visitor can turn to every view of the scene and break the calm silence, save for the music of the rippling waterfall, by exclaiming, "It is beautiful." Not being a poet he has to think out all his feelings, which lacking of genius is a decided disadvantage. Moving across the bridge, the pathway of stepping stones descends between rocks graced with lovely foliage and mosses to the romance of a grotto. Peering into this little eerie of Nature's imitation one almost voluntarily looks for elves and sprites, but these are lacking. There are stalactites and stalagmites, not fanciful, but real, and the imagination grows stronger and quicker. The only break to the fanciful picture is the little incongruity of pure white stalactites suspended from the decidedly discolored limestone formation of the cave. This is an artistic fault. But no blame to the art builder, who perforce had to use the only material available. Despite this the grotto is a splendid copy of Nature, and delightfully picturesque. Turning to the right a flight of stone steps leads the way to the top of the grotto, and near the roof, where yet another pretty panoramic view of the place is obtained. Retracing the steps passing in front of the grotto another flight shows the way by a passage alongside the wall to the entrance, leaving the bridge on the left. But the journey is not complete until the miniature ravine below the bridge has been traversed.

Without close investigation it is difficult to imagine that in the course of this journey the visitor has been traversing a house whose dimensions are only about 35 ft. long by about 15 ft. wide. The pathways measure about 135 ft. in length. This rockery was designed by a gentleman named Robinette about twenty years or more ago, and does infinite credit to his artistic skill. It is built of the waterworn limestone from the River Murray, inset with roots of the mallee tree, which have been introduced by Mr. Cole for the benefit of the ferns, which show a distinct improvement of growth. Cork is also largely used to gain effects with the natural ruggedness of the rocks.

Now, to come to the more prosaic part of particularising a few of the plants which give the artistic beauty of life to this place we note, of course, the elegant spreading fronds of the tree ferns Alsophila excelsa and A. Cooperi. Here, there, and everywhere are the Adiantums and Polypodiums, with a number of others lending variety in their nooks and crannies, while the edgings and beddings are of the soft Selaginella (club moss). Begonias, with their lovely broad leaved foliage of variegated hues, nestling in the rocks or standing out boldly upon some prominent eminence, make a fine contrast to the grace of the ferns. Climbing, intertwining, and covering heights and distances are the beautiful deep green, delicate, feathery like foliage of Asparagus plumosa and A. sprengerii.

But we must linger no longer here, for we have yet other beauties to see, and we pass out with a sense of charming satisfaction to

The Orchid House,

which is hidden away in a most undeserving fashion alongside a sort of back kitchen, through which you have to pass to the treasured beauties. There is an incongruity about this after the fancy free inspired by the romance of the grotto. Facing the orchid house is a very fine collection of beautiful plumaged birds in long rows of roomy cages, and after admiring these feathered beauties we turn into the private apartment of a kitchen maid, who is busy polishing table cutlery, and where also apparently the "boots" labors on his shining pigments. The entry of a stranger into the sanctum of a deft-handed Phyllis causes a look of surprise, but no matter, we are on our way to see the orchids.

If there is one flower more than another that has caused excitement beyond enthusiasm amongst specialists it is the Orchid, the aristocrat of the society of flowers, and at Montefiore we are introduced to a really fine collection, perhaps not so vast in numbers as may be seen elsewhere, but the plants are all in splendid condition, which is saying a great deal, because so few gardeners know how to deal with them. We noted extra fine pieces of Cattleya amethystina, Aerides odoratum, Vanda insigne, Cypripedium barbatum grandiflorum, and C. bellatulum. There was also to be seen Mr. Cole's experimenting at hybridising Phalaenopsis amabilis on to P. Schilleriana. The latter had not quite finished blooming. At its best this specimen was embowered in no less than 51 beautiful blooms. Aureum grandiflorum had also been hybridised, and had many promising seedpods. The beautiful butterfly, Oncidium papilio, had still left on it some delightful flowers, while the rich deep carmine Anthurium Schilleriana was in full bloom. Of all the other varieties nothing need be said further than that is was evident that they were in the hands of a gentleman who understood and appreciated them.

With this we say farewell to Montefiore, with yet another word of praise to the head gardener, Mr. David Cole, congratulation to His Excellency and Lady Way, and expressing the hope that we have not trespassed too much upon their good nature, and that our readers will have learnt something of how to maintain an ideal city garden.

Lifting Daffodils.

It is only those varieties of Narcissi or Daffodils which produce offsets freely that may be lifted annually, and even with these it is not absolutely necessary. What is meant by the annual lifting and drying encouraging increase is that by this means it is possible so to separate and plant the offsets that the stock is increased more quickly. To dry bulbs of Narcissi in general after lifting them is not good practice, especially if they are kept some weeks out of the ground. They should be lifted, divided, and replanted at once. The fact that your small offsets dried up shows that drying and keeping small bulbs out of the ground is not advisable, nor is the separating and planting of very small offsets according to the variety to be recommended. —"Queensland Agricultural Journal."

Answers to Correspondents.

Daffodil.—The correct time to plant Daffodil seeds is early in December. Put them in pans in the shade, and keep them moist, not wet. Use a loose mould of decayed vegetable matter and sand. Plant out in the early Spring, say in August.

Phillis.—One of the prettiest floral decorations possible is obtainable by the use of Shirley Poppies and Maidenhair fern.

Snake.—Snake beans are also known as Asparagus beans. They are like what are commonly called French beans, long and slender, light-green in colour. They grow to about 6 ft. in height and should be staked, or, better still, trellised. Their culinary treatment is the same as French beans, and are highly favoured by some.

Briars.—The specimen of your Veronica is Crême et violet.

Zonal.—The name Zonal used to identify pelargoniums is taken from the zone or horseshoe shaped marking on the leaves.

Pathway.—You have a fairly large extent of pathway, and as tiling is expensive, and not easy to be put down properly except by workmen who understand the business, we would advise the use of long 4 or 6 inch jarrah slats. These are very durable, easily pegged into position, cheap, and look well.

Rose.—You can hardly expect us to answer your question as to which is considered the very best rose, so much depends upon the taste, and other considerations. We may venture the opinion however, for what it is worth, that if a ballot were asked for upon the best rose, we think Marechal Neil would head the list of votes.

Bones.—We presume you do not mean your own bones when writing the question, "what shall I do with my bones." Evidently the kitchen refuse. They are very useful in gardening, but not as you take them from the table. Put them into your manure heap, where they will become softened after two or three months, according to the amount of heat there is in the manure. When softened they are easily crushed, and used with good effects in various ways while manuring.

Centre Bed.—One of the prettiest effects for a centre bed in your lawn can be made of blue, and white Lobelias. Almost any design you can imagine can be worked, and the effect will be good, provided the design is bold.

Landscape Lawn.—Why not have a round bed with a Palm in the centre, and surrounded by Doryanthes Palmeri (Queensland lily). We think you would like the effect on your large lawn. Kentucky Blue grass (Fescue pretensis), Couch grass (Triticum repens) are the best grasses for a large lawn.

Inquisitive.—We do not, as a rule, answer anonymous letters, but do not mind telling you that we have no connection whatever with any nursery or garden, nor any other gardening paper.

Garden Operations for December.

THE FLOWER GARDEN.

Owing to the dryness of the season mulching should have been done more than a month ago, and must on no account be longer delayed. Dig the beds lightly all over, ridding them at the same time of weeds, and then spread a light mulch of short manure. Give the soil good soakings of water occasionally, and frequent sprinkles, especially after hot days and drying winds, to cool and moisten the atmosphere of the garden, and to revive and refresh the plant. This should be a period of free and active growth in most things, and where foliage is an important point, as with Cannas, they will gain in strength and luxuriance with plentiful supplies of water at this season.

Roses have absorbed much time and attention during the past month, and should continue to do so. The flowering season can be prolonged if they are regularly disbudded. Relieve the bushes of all full blown blooms, cutting back to a strong out side bud. If they are suffering from mildew dust them lightly with sulphur or soot. If the aphis is troublesome and persistent it is because the Roses are not growing vigorously from some cause or another, and have not the strength to throw off the pest, and there is some impurity in the sap. Tobacco water will help to diminish the nuisance, but the best way is to encourage the Roses with liquid manure, mulching, and water in moderation to make a free and healthy growth.

Hollyhocks in windy positions, Dahlias, Perennial Phloxes, Bouvardias, Delphiniums will want staking, although they should be so strengthened by being regulated and having superfluous growth removed as to be almost independent of support. In some cases staking is unavoidable, but the stakes should not obtrude themselves so as to make one uncomfortably conscious of their presence. Thin iron ones are the strongest and the least aggressive. Wooden ones can be rendered less conspicuous by painting them a browny-green tone.

Carnations should be flowering freely during the month. They should be carefully staked, three or four small sticks to each plant, or else supported by wire-netting. Reduce the number of buds, leaving only one, two, or three, according to the strength of the stems. Carnations soon exhaust the soil, and when this happens they become weakly and a prey to insects and disease. Renew the soil at their roots periodically, and give them manure water particularly at this period.

Balsams, Zinnias, Amaranths, and other autumn flowering annuals can still be planted out, choosng a cool, showery day for the purpose. Zinnias can be made most effective use of in the borders. Sow seeds of both single and double Portulaca in bold masses in the sunniest borders. The colors are rich, and the flowers have a peculiarly gem-like quality. Peg down Verbenas, Heliotropes, and Petunias to induce a spreading habit. They are not half as effective if allowed to grow tall and spindly.

Continue to occasionally feed and water Chrysanthemums, and towards the end of the month pinch them back, leaving about 6 in. of growth. The flowering period of many annuals can be considerably prolonged if the flowers are regularly picked and not allowed to seed. Sweet Peas treated thus can be made to bloom for four months. If seed is desired, keep a separate patch for the purpose, and avoid cutting the flowers.

LILIUM AURATUM.

The following notes from the pen of "Danske Dandridge," a frequent contributor to the "Chicago Gardening," will be read with interest by many who have found how difficult it is to save their Lilium auratums from disappearing, and who have noticed that although young bulbs form few or none ever survive to bloom in place of the old bulb:

A variety called platyphyllum has very large flowers quite 9 in. in diameter, and broad leaves. There are some beautiful hybrids raised between Lilium auratum and other species. One of these is Lilium Parkmanni, with large white flowers, banded and spotted with crimson. This lily is said to increase rapidly. The young bulbs should be separated from the parent plant and planted out in good deep soil. They need a sheltered position; if possible a nook in the shrubbery sheltered from the north and west and open to the south. Other plants, like rhododendrons or pæonias, in the same bed, are a great protection to them.

Many people complain that their auratum lilies soon disappear. It seems that the old bulb breaks up after a season or two. But it forms several small bulbs, and if these are separated from the parent and planted in suitable soil, they make nice plants in a short time. If they are not replanted, they share in the decay of the parent bulb. The platyphyllum variety is more permanent than any other kind of auratum. Henry Bright, in his interesting 'Year in a Lancashire Garden," writes that he has a bed of Lilium auratum with heliotrope growing between. He takes up the lily bulbs in the fall and grows them on in heat through the winter, and then plants them out in the spring. In this manner he does not lose them, but says that they are every year more beautiful and vigorous.

Our speciosum lilies have never been so fine. We are now having dry weather, but they do not seem to mind it. They are in shade, and in the same bed are many white and carmine-red phloxes, which need very little sun. They do not scorch and wilt as others that are in the sun do in dry weather.

FEEDING OR REPOTTING.

A great many plants flower better and keep in good health if they simply get regular feeding with liquid manure in the growing season, instead of repotting every spring, as is generally done. The let-well-alone system does not suit all plants, but I have proved with a great many if once they have attained a good size all they require is a renewal of the drainage every two years, and in some cases a top dressing composed of good soil with a little chemical manure in it or dried sheep droppings. Repotting such plants as Sparmania africana, Choisya ternata, several of the Salvias, or even some of the strong growing Geraniums, produces strong growth but few flowers, but at the same time pot bound plants require to be watered oftener in dry weather. Still they make short, firm growths, and do not flag very readily, and when the season of flowering comes round every point or shoot will flower well. I have a large Nerium splendens, which has an abundance of flowers every year, and which has not been repotted for five years; but it is generally watered twice a day during the summer months. For Maidenhair ferns, Azaleas, Palms, stove Begonias, and others repotting every two or three years is often enough, unless one wishes to get up large plants to fill the houses, instead of keeping them dwarf, so that a greater variety can be grown.—J. C. D., in the "Gardening World."

New South Wales Notes.

(From our own correspondent.)

Sydney.

After the recent acceptable rains we have struck rather trying weather for the gardens, hot dry winds prevailing. Notwithstanding this, our gardeners have made the most of the time at their disposal, judging by the number of shows held during the past month. This season has produced many fine Carnations, and just now this flower forms the principal exhibit in our florists' windows. Gladioli are also much "en evidence."

An enquiry was made of me the other day as to a remedy for treating some apricot trees that had been attacked by white ants. Personally, I would not spend any of my time in endeavoring to pull round trees so affected, but would root them out, being of the opinion that there is too much risk attached to their again becoming satisfactory trees. Many gardeners to whom I have spoken concur in my opinion. As regards the remedy the Botanic Gardens informs me that in the case of young oak trees that had been similarly attacked they have found that by dosing the roots with a mixture of treacle and arsenic they invariably managed to dislodge the pest.

On the 13th instant Messrs. Searl and Sons made a very fine display of Carnations, which were grown by several of their amateur friends. Conspicuous amongst them were the following varieties, which were especially worthy of attention:

Artemus: One of the most attractive varieties exhibited; a beautiful blending of slate color and cerise; a fine distinct flower.

Lorna Doone: Bright scarlet flake, heavy petal, fine form.

Mrs. Tremaine: One of the best yellow ground, bright edged, fancy Picotees yet exhibited in Sydney, and likely to have a large sale when ready for distribution.

Mrs. Eric Hambro: Pure white; perfect form.

Sigurd: Clear salmon apricot; an improved Mrs. Reynolds Hole; flowers large and full; very good.

Mephisto: A clove-scented variety of a rich deep maroon; splendid form.

Wm. Pratt: A pretty blending of pink and reddish shades combined.

Incomparable: A beautiful bloom, comprising a blending of cerise and rosy pink.

Germania: Bright yellow.

Mrs. Davey: A grand variety; white ground edged and striped purplish rose; excellent form.

Amarantus: A very beautiful deep purple; fine, well-formed flower.

Annie Douglas: Very fine; a canary ground, white edge flaked carmine.

Hilda: A rich yellow ground, heavily picoteed with rich dark red.

Britannia: Deep rich yellow; one of the best of its color.

Miss Audrey Campbell: Lemon self; a beautiful shade.

Mrs. M. Georgeson: Creamy white ground, splashed purple and orange; perfect bloom.

This firm informs me that they will have plants of the various sorts next autumn, and lovers of Carnations would do well to communicate with them in the meantime.

On the 25th October ultimo the Neutral Bay Horticultural Society held its third annual Spring Show. The Hon. Malbon Thompson declared the show open, and complimented the members on the excellence of their exhibits.

Among the non-competitive exhibits staged was a magnificent display of Orchids and Hippeastrums grown by Mr. Duncan Carson, of Pymble. The Orchids included some blooms shown and grown by that gentleman for the first time in Australia.

The champion rose certificate was awarded to Mr. G. Kershaw; that for the Carnation under like conditions to Mr. W. M. Musgrove. The name of the Rose was La France de 1898, the Carnation being a bloom of P. S. Waller.

In the members' section Mr. G. W. Colley-Priest won the certificate for the champion Rose and Mr. F. N. Camroux that for the champion Carnation.

The following is the list of other prize-winners:

Open Section—Roses, Messrs. G. W. Kershaw and W. Musgrave; Carnations, Messrs. W. Musgrave and C. N. D. Richardson.

In the Members Section—Twelve roses: F. N. Camroux. 1; G. W. Colley-Priest, 2. Six Roses: G. W. Colley-Priest, 1; W. E. Cook, 2. Three Roses: S. H. Robertson, 1; G. W. Colley-Priest, 2. Three Roses (light); F N. Camroux, 1; Mrs. Seaver, 2. Three Roses (dark): F. N. Camroux, 1; W. E. Cook, 2, Two Roses: F. N. Camroux, 1; G. H. Peden, 2.

Twelve Carnations—F. N. Camroux, 1; J. Stavenhagen, 2. Six Carnations: F. N. Camroux, 1; W. Lloyd, 2. Three Carnations: F. N. Camroux, 1; Mrs. Seaver, 2. Three Carnations (light): F. N. Camroux, 1; G. W. Colley-Priest, 2. Three Carnations (dark): F. N. Camroux, 1; G. W. Colley-Priest, 2.

Cut flowers: W. E. Cook. Three cut flowers: Mrs. Malbon Thompson. Six antirrhinums: A. R. Harrison. Three antirrhinums: A. R. Harrison. Twelve pansies: R. Miller. Six pansies: R. Miller.

Arrangement of cut flowers Miss Belbridge. Flowers in stand: Mrs. R. J. Maclean. Two buttonhole bouquets: Miss Belbridge, 1; Miss Peden, 2 Two sprays: Mrs. Lloyd.

Three foliage plants: S. H. Robertson. Two pot plants: Mrs. Malbon Thompson. One palm: Miss Peden. Three ferns: G. W. Colley-Priest. Hanging basket: G. W. Colley-Priest. Dish of peas: F. N. Camroux. Collection of vegetables: A. R. Harrison 1; F. N. Camroux, 2. Collection of vegetables, three varieties: A. R. Harrison, 1; G. W. Colley- Priest, 2.

The judges were Mr. L. Leplastrier and Mr. Ferguson, of the Royal Nurseries.

The certificates were presented at the close of the judging by Mr. Felix Randle, chairman of the Stock Exchange, one of the vice-presidents of the society.

The usual monthly meeting of the Horticultural Society of New South Wales was held on the 11th instant in the Queen's Hall, Pitt-street. The attendance of members was very good, and the blooms staged very satisfactory. One splendid collection of Carnations was received too late for judging, but was really excellent as to quality.

Mr. Kershaw again won with his Roses. This gentleman has scored at all our shows with his blooms.

Mr. J. H. Horton made a beautiful display with Shirley Poppies. They were splendid.

Mrs. Horton won the prize for the bouquet of Carnations and grasses, but was run very closely by the other place-winners.

Mr. H. H. B. Bradley had a very good exhibit of miscellaneous Bulbines, which attracted much attention.

The show was very good, but want of space precludes my giving fuller details.

* * *

Queen Alexandra always delighted in red dish violet flowers, such as the Clematis, Pansy, etc., and purple being decidedly a Coronation colour, purple blossoms are to be much sought after for table decorations and personal wear.

Hybridising Gladiolus Species.

TO THE EDITOR.

Sir—In view of the rapidly growing interest in the Gladiolus, I have herein culled a few of the more interesting points made in a paper read by Dr. W. van Fleet before the International Plant-breeding Conference held in October of this year in New York.

It appears that the best of the new species and forms collected in the past six years came from Natal, Swaziland, and Madagascar. One of the most promising from a flower lover's point of view came from Mount Kilimandjaro, in German East Africa (now spelled by the Germans Kilima-Noscharo). The European grower who has done more in recent years in the way of introducing these new species and forms of the Gladiolus is Herr Max Leichtlin, of Baden-Baden, Germany.

A tall growing form of G. platyptyllus from Swaziland has green blooms covered with pencillings of bluish purple. By crossing it with the best violet blues in the Lemoine class a good start has been made towards a true "blue" Gladiolus.

The Psittacinus group is of great interest as the foundation of the splendid Gandavensis strain and through it of all finest modern Gladioli. Dr. van Fleet has been able by careful and long-continued experiment to prove that the Gandavensis is the product of the crossing of psittacinus and oppositiflorus. This latter is of tall growth and often opens from 18 to 24 flowers simultaneously. Growers will probably find among their seedlings of Gandavensis plants producing flowers on both sides of the spike and facing opposite ways, and not ranged in two rows down the stem and facing one way as the proper show spike should do. In these cases the old oppositiflorus species is recurring, and it will be interesting to producers to know it.

Some extremely interesting results have been obtained, and at the same time some very disappointing ones.

For instance, seven years' work in pollinating consecutive generations of the Adlami section of the psittacinus group with "Canary Bird," the best of the yellow Gandavensis, produced two good yellows. "Canary Bird" itself is good, but weak in the stem, which is practically invariably crooked; but in every other point is good. These two yellows, however, are next door to sterile, their increase being provokingly small.

In some of the species the life forces produced in the plant by long ages of natural selection take some time in overcoming, and it has taken as much as 6 or 7 generations of consecutive pollinating before their inherent resistance has been overcome so that really valuable breaks could result.

The true and perfect ideal, from a florist's point of view, in white or yellow Gladioli has not yet been reached. In both cases where the colour has been attained the resultant bulb has lacked vitality, and its powers of perpetuation have been nearly nil.

In other words, a blind alley has been reached in the Gladiolus maze, and the searcher after perfection has had to turn back and begin again. Fortunately, the scientist can carry on concurrent experiments, and with a large number of crosses, so his experience and his results can be fairly rapidly attained. Dr. van Fleet mentions a bulb which was collected in Swaziland in an immature condition, and lay dormant after planting for two years, finally throwing a spike of thirty-two flowers with pale lilac markings.

One statement made by the essayist will find an echo in the experience of many in Australia, viz., that "all growers of Gladioli of the Gandavensis type know that there is a constant preponderance of the red varieties. The white and light colours tend to degenerate with greater or less rapidity, while the reds increase in number and retain their vigour. So rapid and complete is the reversion in some instances as to amount to wholesale atavism. Considerable numbers of a choice Gandavensis variety, propagated from cormels in the usual way, have changed in a single season so as to closely resemble a typical red and yellow Gandavensis. This seems to confirm Mendel's theory of dominant and recessive factors in all hybridizations. Taking psittacinus as the dominant oppositiflorus acts in most instances as the recessive type and tends rapidly to efface itself in favour of its more virile partner during reproduction by seeds, and to a lesser degree during extension of a given hybrid plant by cormel, or in other words, bud propagation. Gladiolus purpureo-auratus is well known to be the foundation of the popular Lemoinei and Nancieanus strains of commercial varieties, and G. papilio of the 'blue' Lemoinei kinds. These latter comprise a number of attractive heliotrope and purple-blue shades in the typical hooded form of the parent. Papilio albus is a handsome slender-growing variety, reproducing itself perfectly from seed. It is very pure white in colour, with a crimson purple blotch. Crossed with the best whites among the Gandavensis and Lemoinei sections, it produces a few attractive and distinct new light garden forms amid a great proportion of inferior ones. The species typified by Gladiolus Saundersii are of the first importance. Saundersii in the hands of Herr Max Leichtlin gave us the magnificent strain known in commerce as the Childsii, and the large flowered, brilliantly colored Nancieanus sections produced by the Messrs. Lemoine by crossing purpureo-auratus hybrids with the new species. Leichtlin used pollen from the finest procurable Gandavensis varieties on Saundersii, and the result is a class of gigantic richly coloured kinds, mostly of red tints, with widely expanded blooms, and having a nodding upper segment. When the reverse cross is made and the ovules of Gandavensis fertilized with Saundersii pollen the result is far less striking."

Among other types described by Dr. van Fleet, but less known to the average grower, are Leichtlinii, Cruentus, and especially Princeps, one of his own raising, and of remarkably fine character. Eckloni and Ludwigii are also rare new species, and all of these are being used with each other, and with the best forms of the older commercial sections to produce new and desirable types and varieties, some of which will again be used for crossing with the above named.

So many types with fixed characteristics now exist that the series of crosses that may be made are apparently endless. These are increasing, consequently we may look for some startling improvements even over the present marvellously diverse collection of hybrids now in commerce.

As showing the wonderful vitality of Gladiolus bulbs, I may state that we now have growing a few seedling bulbs out of over two hundred one-year tiny seedlings received two years ago from Canada. These were kept two years dry in a box, and after surviving over two seasons some of them have sprung into healthy growth.

I am, Sir, &c.,
FRED. C. SMITH.

Aldgate.

Howell's Seedling Gladiolus.
[Photo. by Rev. E. G. Moberley.]

The Prince Consort practically created the beatiful gardens at Osborne, and used to boast that there was scarcely a tree there that had not been planted by himself. One of these is famous—the now great myrtle which was struck from a sprig of the wedding bouquet of the late Empress Frederick. Every bride in the Royal Family since then has carried a spray of this tree with her to the altar on her wedding day.

Geum.—This is one of the most useful of our summer flowering perennials. The blossoms are rich crimson-scarlet, and are continuously produced. Spent blossoms should be persistently removed, thus keeping the plants in a healthy condition. There are few subjects so elegant in appearance, profuse in their display, and so capable of enriching the hardy flower border.

Worms in Lawns.—The best treatment for worms in lawns is lime water.

Multiplication of Ferns.

(From "Amateur Gardening.")

Every one versed in botany, even in a slight degree, is aware that fertilization is effected in flowering plants by the shedding of the pollen over the stigma; but in ferns the seed appears on the backs of the leaves without being preceded by the pollen or anthers, or, in fact, any of the ordinary fertilising apparatus. Hence they are ranged under the class of cryptogamia, or hidden fructification. Many attempts had been made to detect anthers, or bodies analagous to them, intermingled with the seed, or adjacent thereto, but it was not until nearly fifty years since that anything certain was known on the subject, when Count Luminski, a well-known Polish botanist, brought forward observations demonstrating the process of fructification and its entire harmony with that of other plants.

When a Spore or Seed Germinates

it first produces a leaf-like expansion clinging close to the soil, and deriving nourishment from rootlets emerging from its under surface. This first leaf or primary frond bears no resemblance to the true leaf of the fern. It is very much alike in all species of the tribe, and is usually temporary. It is a most important part of the plant, however, for it is on this that the anthers and pistils are produced and fertilization effected through their union. In order to be satisfied of this let the primary frond be examined carefully with a powerful microscope, and there will be found to arise amongst the common cells others of a peculiar character. Instead of coloring matter these contain granules, which speedily also become cells, packed and pressing one against the other within the parent cell like the seeds of a pomegranate against the rind. These compound cells have been termed antheridia, and

Are Analagous to the Anthers

of flowering plants. Besides these antheridia, which are generally numerous, a few other bodies become apparent, consisting each of a cell with a tubular neck somewhat resembling a flask, and at its bottom it contains a single germ cell. These bodies are termed pistillidia, and represent rudimentary fruit of the more perfect order of plants. Following the progress of the antheridia ,these are found to burst and liberate the secondary cells. Each of these includes a longish body, folded up in itself, which is set at liberty by the rupture of its prison walls, and is then seen to be in shape somewhat like a tadpole with a slight enlargement at the tip of the tail. These are termed

Spiral Filaments,

and Luminski was the first to demonstrate their nature and use, although they had been noticed by others on the primary fronds before. As soon as these spiral filaments are released by the bursting of the antheridia and secondary cells, they move about with a lively and independent action through the mucilaginous fluid on the surface of the frond, and, entering the open mouths of the bottle-like pistillidia, come into contact with the embryo at its bottom, forthwith effecting fertilization. Several spiral filaments usually enter one pistillidium, and the dilated extremities of their tails are applied to the embryo or germ cell in the way as we see many particles of pollen shed over the stigma of the higher order of plants in order to ensure the proper setting of the fruit.

The Germ Cell

being thus fertilised, instead of passing into the state of perfect seed, as in flowering plants, commences forthwith to grow, and by the ordinary process of cell growth, pushing forward roots and leaves, gradually develops into the fully grown plant. In flowering plants it is well known the cotyledon furnishes the embryo with nourishment in the early stages of its growth till by the development of the necessary organs, it is able to support itself. In the fern a primary frond takes the part of the cotyledon by supplying nourishment to the fertilised embryo, until, having put forth leaves and roots, it is enabled to exist on its own resources. From what we have here stated of

This Wonderful Process

it is very evident that the germ cells of the pistillidia are the true seeds of the fern; but it is also evident that one of the purposes which seeds serve, namely, the multiplication of the species, cannot well be effected by them, hence the production of gemmæ, or spores on the back of the leaf. We find in many plants by which propagation or increase may take place. The familiar Turk's cap lily carries a bulbil in every axil of its stem. The begonia and achimenes frequently produce nothing else instead of flowers, yet although the parent plants may be reproduced and increased by these, one never thinks of calling them seeds. No more are the gemmæ of ferns entitled to be styled such. The inflorescence of the fern, in fact, seems to stop short in the middle of its course, and instead of showing flower, unfolding the parts of fructification, and perfecting its seeds, as other plants usually do, it contents itself with forming flower buds merely, which, separating from the parent, furnish the means of increase and dissemination. When these find resting places they expand into primary fronds, bear anthers, and germs of their own, and in this respect are undoubtedly analogous to the flowers of the thousands of flowering plants that grow in greenhouse and garden.

W. N. Brown.

On Flower Arrangement.

Flowers are with us (says "Amateur Gardening"), and not only gardens, but rooms are full of sweet blossoms, but what a difference there is in arrangement. From the bowl or soup plate in which roses lie half-submerged to the single flower glass with a rim to take the weight of the petals is indeed a far cry. To our mind bowls should not be used without some arrangement for keeping the flowers up, and as this can be easily managed with wire, there is no reason against it. Then glasses should always have rims on which the flowers can rest, and the fluted edges are far better than smooth, as the flutings keep each separate flower in place. As a rule

Flowers Should Not Be Too Much Mixed,

and though several kinds of the same order —daisy-like, for instance—may be united, colors and sorts are far more effective separate. Take, for instance, a handful of the aforesaid compositæ—marguerites, annual chrysanthemums, gaillardias, rudbeckias—mixed they will look very well, but sort the different glasses, and how much better the effect will be, and you may group your glasses as you like. All the

Common Summer Flowers

—snapdragons, Canterbury bells, marigolds, mallows, sweet peas, &c.—are charming alone, but mixed they look vulgar, and their colors clash. There is nothing better for a rest to the eye among a mass of gay flowers than a vase of mignonette, which, by-the-way, should always be alone, as flowers mixed with it invariably die, but the patch of dull green among gay colors is wonderfully restful and fresh.

Foliage

is a vexed question; in our opinion it is often overdone; many flowers which grow well above their leaves look far better when not overdone with green that does not belong to them, and though a veil of delicate fern gives an added charm to exotics, a mass of common green spoils outdoor flowers. Nasturtiums are about the best flowers we know

For Dinner Tables,

and the transparency of their petals lights up beautifully at night, and you may either arrange for color with your flowers massed together or for shape, with each bloom standing separate and plenty of their own delicate leaves. If tea roses can be cut with buds and strong, long stalks, they are all the more beautiful, but it seems a waste sometimes. Dahlias should always go in shades or separate colors; their range of color is so enormous that together they can hardly help clashing; and perennial sunflowers and Michaelmas daisies should be kept severely apart. We must add

One Word About Asparagus,

"it is so light and pretty!" Yes! my dear madam, but it is a vegetable, not a fern, and gets dabby and messy, and your "light" arrangements are absurd, except on a small scale. Keep it out of the tall vases for Heaven's sake, and fill large things with big leaves and flowers, and keep your "light foliage for small specimen glasses, and then forget it.

M. P. S.

ROSES.

The Great Temple Rose Show in London.

These notes, culled from the reports of this great annual English show, will be interesting to many of our rosarian readers:

As an exhibition of specimen Roses the display was a failure. There were numerous entries, but the retarding season had kept back the blooms. The bloooms shown consisted in the main of Hybrid Teas, Teas, and Noisette, and some varieties not usually staged at large exhibitions had to be called into requisition to make up stands. Among the new Roses shown in cut blooms can be mentioned Messrs. Frank Cant and Co.'s Lady Roberts, beautiful in tint; Souvenir de Pierre Notting, a delicate soft yellow tea scented variety, and Dorothy Perkins, a new climbing Rose, which recently gained an award of merit from the Royal Horticultural Society. It is the result of a cross between Rosa Wichuraiana and H. P. Madame Gabriel Luizet. It produces its flowers in large clusters of a shell pink tint with a white centre, and the new pink Rambler, Queen Alexandra, was also to be seen. It is a new pink Rambler, but the group of Ramblers increase rapidly.

The collection of garden Roses, shown in bold bunches, was one of the features of the Rose Show, but the heat of the tents told somewhat severely upon the semi-double and single blooms, and many of them dropped to pieces. One of the features of the show in the great tent was the standard forms of R. Wichuraiana varieties, which form large symmetrical weeping heads, the drooping branches laden with blossoms. Among them were Rene Andre, double, creamy white tinted with pink; Augustue Barbier, double, soft pink; Alberic Barbier, double, white; Paul Transon, double, creamy white, and Francois Foucard, yellow, double. It was said that some of these were submitted for award to the Floral Committee, but that not one was made, and I heard complaints that subjects so intrinsically good were not recognised, but the fact is they should be dealt with by Rose experts. Of the new Polyantha Roses, Eugenie Lamesch, color orange yellow passing to clear yellow with a shading of rose, and producing its flowers in clusters of from ten to thirty blooms, and Leoni Lamesch, color bright coppery red, with golden centre, very distinct and beautiful, and others. This was a very fine group of Roses, quite maintaining the old character of the Royal Nursery, Slough, for high-class culture.

In a large group shown by Messrs. Paul and Son, the Old Nurseries, Cheshunt, appeared several novelties, among them a variety of Rosa sinica, named Anemone, a large and attractive single variety of a bright rosy carmine tint; the new weeping R. rugosa alba, which has a remarkable pendant habit of growth. This was awarded a gold medal by the Royal Horticultural Society. Then there was a new perpetual Rambler named Purple East; and Leuchstern, a polyantha with the growth and foliage of the Crimson Rambler, the large single flowers bright rose, with a white centre, and an abundant bloomer. In addition, there was a Una, a semi-double white, the result of a cross between Rosa canina and a Dijon tea variety.

Vase of Tea Roses.

SOME NEW ROSES AT THE TEMPLE ROSE SHOW, LONDON.

(From "Gardening Illustrated.")

There was nothing very startling exhibited at the Temple Show of the National Rose Society this year, excepting Mildred Grant. Those who saw the bloom that received a special medal as the best Hybrid Tea in the show can safely say they never saw a finer flower. Of Roses not yet in commerce I thought well of Princess Victoria, although perhaps rather too near Viscountess Folkestone; and Dr. Campbell Hall, something after La Fraicheur. Sir Robert Stout resembles Charles Lefebvre, and will be very welcome, for we want dark Roses, and if they are Hybrid Teas so much the better. There was also shown a white sport from Lawrence Allen, which should be valuable if it retains the good form of its parent. Somehow the boxes of new Roses usually seen at shows cut a sorry figure, and they often libel a Rose, for how can one obtain a good bloom from a plant perhaps weakened through propagating. Many Roses are now introduced which, taken as individual flowers, fall short of the exhibitor's ideal, but the profusion of bloom and their late-flowering character give them a value which all who desire their gardens to be gay in autumn are ready to admit. Taking the varieties alphabetically, my first is—

Alice Lindsell (H.T.): A gold medal Rose having creamy-white flowers with pink centre, petals of great substance.

Ben Cant (H.P.): A grand flower, color deep crimson with dark flushes in the centre. It is of the Victor Hugo type, being a cross between that variety and Suzanne M. Rodocantchi. It is very sweet ,very perpetual, and a good grower.

Boadicea (Tea-scented): In color pale peach with rich pink shading. The flowers are high centred, petals large and stiff. It is somewhat after the style of Mme. de Watteville, but a deeper and really handsomer flower. It is sweet-scented and a strong, vigorous grower.

Dorothy Perkins: A hybrid of that interesting Rose R. Wichuriana, and from its exquisitely-formed blossoms in huge panicles and lovely pink color will be valuable as a pillar Rose. Unlike the type this Rose grows erect in the way of Crimson Rambler, and will be a useful companion to it.

Dr. Felix Guyon: A Tea Rose of charming form, orange in color with apricot shading, very double, will make a good show bloom.

Ethel Brownlow.

Brought out in 1887 by Dickson and Sons; colour rosy flesh, shaded with salmon, a type of the imbricated form. A comparatively weak grower, but under high cultivation, producing some wonderfully fine blooms. A beautiful rose for decorative purposes where the buds have been left unthinned. A rose of good lasting quality and a universal favourite.

Duchess of Portland (Hybrid Tea): Rather too near Kaiserin Augusta Victoria—in fact, it seems a glorified form of that grand Rose.

Frau Karl Druschki (H.P.): Snowy white, deep conical buds of splendid appearance. Open flowers are large, not too double, consequently expand freely.

Fusion: This is a seedling from Mme. Eugene Verdier, but more vigorous, consequently will make a good wall Rose. Color deep chamois-yellow.

Lady Battersea (H.T.): This, a cross between Mrs. W. J. Grant and Mme. Abel Chatenay, has a finely-formed bud, but the open flowers are rather disappointing. Color cherry-red, tinted orange.

Lady Moyra Beauclerc (H.T.): A valuable forcing and show Rose, rich madder pink. Very distinct, free-blooming and free-growing.

Lady Roberts: A charming and highly-colored sport from Anna Ollivier. Color rich apricot with coppery-red base to petals.

Mme. Antoine Mari (Tea-scented): One of the prettiest new Roses I have seen for a long time, the buds are so perfectly moulded, and the color rose washed and shaded white, being most attractive. The open flowers are nearly as large as those of G. Nabonnand.

Mme. C. Monnier: A semi-climbing Hybrid Tea of great merit. Flowers rosy-flesh, centre yellow with salmon and orange shading. Like many of the Hybrid Teas, in autumn or when forced, the flowers come almost entirely orange-yellow.

Mme. Jean Dupuy: This Tea will, I think, become as popular as Mme. Lambard. The color is a reddish-yellow in centre, outer petals suffused with rose-pink. The growth, too, is vigorous.

Mme. Marie Croibier may be described as a deeply-colored Caroline Testout. This, with the type and the white sport Admiral Dewey, should make a charming trio.

Mme. Vermorel (Tea-scented) is one of the best Teas we have had for some time. It opens well outdoors, and the blossoms are of great substance. Color coppery-yellow with rose shading. It is a good grower.

Mamie (H.T.): A little wanting in brightness, otherwise a beautiful shapely bloom of great depth. A fine grower, color rosy-carmine with yellowish base.

Mercedes: A soft rosy-pink-colored Rugosa Rose, as lovely in form as a Tea Rose, and the color equally as delicate.

Mildred Grant (H.T.): A noble flower for the show board, but I should prefer to test it further in the open before pronouncing an opinion as to its merits in the garden. The color is blush-white, tinted pink. Enormous petals like large shells.

Morning Glow (Tea-scented), rosy-crimson, shaded orange and fawn, is a splendid grower, and will be much sought after for its color. It it also of large size.

Noella Nabonnand: A climbing Hybrid Tea, even more vigorous than Reine Marie Henriette. It is a fine semi-double flower of the Bardou Job type, color velvety-crimson, shaded violet.

Pauline Bersez (H.T.): Creamy-white with yellow centre, fine buds, good grower, very promising.

Peace: A white-flowered sport of G. Nabonnand, possessing the fine characteristics of this excellent Rose.

Perle Von Godesberg (H.T.): A sport from Kaiserin Augusta Victoria, color golden-yellow. I believe this Rose will be much wanted, but should prefer to see a little more of it before giving a definite opinion.

Prince de Bulgarie (H.T.): Color silvery-flesh with salmon shading.

Queen Alexandra: A rambler Rose that has given much satisfaction. Its color is rich rose-pink. Fine trusses like Crimson Rambler, and equally free in growth.

Robert Scott (H.T.): This looks like a glorified Comtesse de Serenye, and its fine bold flowers are useful either for show or cutting. The growth is somewhat stumpy, as one might expect from a cross between Merveille de Lyon and Mrs. W. J. Grant.

Soleil d'Or: This fine break will be in demand presently. It is a fine garden Rose, and blooms freely in autumn. It is a hardy kind, and will be useful for its color in districts where it is not safe to grow the Tea Roses.

Souvenir de Pierre Notting: I expected to see a grand flower from a cross between Marechal Niel and Maman Cochet, but as seen up to the present I cannot say much for it.—Rosa.

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A List of Good Roses.

We give a list of well-tried varieties in their colors, naming Hybrid Perpetuals first:—

Whites and Blush Color: Clio, Merveille de Lyon, Marchioness of Londonderry, Margaret Dickson, Violette Bouyer.

Pinks: Baroness Rothschild, Francois Michelson, Madame Gabriel Luizet, Heinrich Schultheis, Helen Keller, Mrs. John Laing, Marquis de Castellane.

Reds: Alfred Colomb, Captain Hayward, Duchess of Bedford, Dupuy Jamain, Etienne Levet, Duke of Fife, Gustave Piganeau, Madame Marie Rady, Ulrich Brunner, Susanne Marie Rodocanachi, Comtesse d'Oxford, Victor Verdier.

Dark Crimson: Charles Lefebvre, Fisher Holmes, Louis Van Houtte, Prince Arthur, Abel Carriere, Baron de Bonstetten, Sir Roland Hill, Xavier Olibo, A. K. Williams.

Tea Roses: Anna Ollivier, Bridesmaid, Catherine Mermet, Comtesse de Nadaillac, Enchantress, Francisca Kruger, G. Nabonnand, Hon. Edith Gifford, Innocente Pirola, Madame Chedane Guinoisseau, Madame Cusin, Madame Hoste, Madame Lambard, Maman Cochet, White Maman Cochet (this is an improvement on the parent in every way), Marie Van Houtte, Muriel Grahame, The Bride.

Hybrid Teas: Mrs. W. J. Grant, Cannes la Coquette, Caroline Testout, La France, Augustine Guinnoisseau, Captain Christy, Charlotte Gillemot, Clara Watson, Countess of Caledon, Grace Darling, Duchess of Albany, Danmark, Kaiserin Augusta Victoria, Marjorie, Marquis Litta, Viscount Folkestone.

If one class of Roses is better than another it is the Hybrid Teas. Most of them have the vigor and hardiness of Hybrid Perpetuals, with the refinement of the Teas.—"Amateur Gardening."

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Rose Arches.

The arches should be from 7 feet to 8 feet high. We have no fancy for the wirework arrangements usually erected, but would prefer an arch of stout iron about the thickness of gas piping. The arches may be made to span the path according to width of latter. You must trench the ground deeply and add some good farmyard-manure, but see that this be not brought into close contact with the roots when planting. Some of the best Roses for arches are summer-blooming only, but you could plant one of these and an autumnal bloomer against each arch, so that you obtain blossom late as well as early. We give you the names of eight of each. Summer Bloomers.—Red: Crimson Rambler, Amadis. Pink: Flora, Queen Alexandra. Yellow: Electra, Claire Jacquier. White: Felicite-Perpetue, Bennet's Seedling. Autumnals.—Red: Reine Marie Henriette, Longworth Rambler. Pink: Mme. Marie Lavallee, Climbing Captain Christy. Yellow: Gloire de Dijon, Mme. Berard. White: Mme. Alfred Carriere, Aimee Vibert. There is a climbing Moss Rose named Cumberland Belle which would do well for a pink summer-blooming variety.

Many of the fast-growing Roses are inclined to bareness at the base. We should advise you to unfasten one or two of the main growths and renail them to the wall in a zig-zag fashion. By so doing you encourage basal eyes to start into growth, and in a year or two there should be several young growths. Another plan is to cut down to the ground one of the oldest growths each year, but where there are only one or two such growths, then the former method is best. There should be no difficulty in securing a bushy base to Felicite Perpetue if you adopt one of the methods described above. The long growths at the top should be thinned out, shortening such of the others as are retained and that are extra long. By leaving them as long as is practicable the bush growths will be considerably assisted.

Yellow climing Roses for Pillar: Five good kinds would be—Duchess d'Auerstœdt, Billiard and Barre, Belle Lyonnaise, Mme. Moreau, and Reve d'Or. The variety Souvenir de Mme. Eugene Verdier is a Hybrid Tea of dwarf growth. Mme. Eugene Verdier is a charming Tea Rose, rich orange and yellow in color, but scarcely strong enough for a 6-ft. pillar.

Rose Countess of Oxford: This Hybrid Perpetual is never seen better than it is in autumn, and, like its sport, Pride of Waltham, the very large flowers show up well on the plant. The color of Countess of Oxford is bright carmine-red, a glowing tint, free from all suspicion of magenta or purple. The foliage is very showy, and in the wood the variety is very distinct, as not a thorn is to be seen. It can be propagated readily from cuttings, but the finest blooms are cut from plants on the seedling Brier. It is a pity such a gorgeous Rose has no fragrance, but it shares with the majority of the Victor Verdier race this distinction.—Rosa.

White Maman Cochet.

(Cook 1897.) A sport from Maman Cochet, which it closely resembles in form, habit of growth, and its generally good qualities. Colour, creamy white; in spring the outer petals frequently tinged with rose. Large, full, with pointed centre, a typical exhibition flower, and since its introduction has appeared in almost every prize collection of its class in both England and Australia. A perfect gem, and should be in every garden.

A Rose Hedge.

By Frank Cant, in "The Gardeners' Magazine."

One cannot but admire the Wild Dog Rose, throwing its wreaths of blossom well above the hedgerow on which it depends for support, but just for one moment imagine the beauty of a whole hedge of wild roses (Rosa canina) supporting their own wreaths of thousands of blushing blossoms, and defying the elements. Neither frost, early or late, nor wind, nor rain, nor anything else can arrest their determination to be first to unfold their graceful beauty. Beautiful as this picture may appear, it can in no way compare with a hedge of Penzance briers. They are simply magnificent for forming hedges. The plants are vigorous, throwing up strong rods as thick as walking sticks, and from six to eight and ten feet high, set with thorns and formidable as a square of infantry prepared for a cavalry charge.

To form a hedge with such subjects is an easy matter, and I will tell briefly how it may be done. There are many situations in which a Rose hedge is desired, but for many reasons has never been planted. Objections are sometimes raised that Rose hedges, although very beautiful, are useless, because they form no protecting boundary. This objection does not remain since the advent of the hybrid briers, and I venture to assert if these Roses are planted, in almost any soil, in two rows, two feet from row to row, and three feet from plant to plant, they will form, with the assistance of a little binding and interlacing of the stronger shoots for a couple of seasons, not only an object of the greatest beauty, but also an impenetrable fence, through which no animal with a divided hoof can penetrate, and after four years' growth even a man who rides hard to hounds will draw rein and look before he will make up his mind to negotiate it, and in the end will seek the gate. No barbed wire is required for a hedge of Penzance Briers.

Maman Cochet.

Tea (Cochet, 1893). Introduced into this State in 1897, and spoken of in England as one of the finest teas sent out during the last ten years. Colour described as light pink mingled with salmon yellow, outer petals tinged with bright rose; growth vigorous and free-flowering, blooms of large size, and standing our variations of weather well. An absolutely dependable Rose, easy to grow, and responding readily to good cultivation in richer colouring and increased size of flowers, which, however, are inclined to come coarse if too closely pruned.

The best way to start a hedge of these Roses is to tie the long shoots of each plant to the base of its neighbor, and continue this from end to end, no pruning being required. In the following spring growth will be emitted from all the lateral buds, which will produce quantities of single blossoms varying in color from coppery orange to almost white, and varying in size from one to two and a half inches in diameter, strongly perfumed with the odor of sweet brier which is also much in evidence in the foliage. The flowers are followed by seed pods in great abundance, varying in size and color, some ripening an orange yellow and others quite scarlet, which hang on the plant, producing a charming effect. The flowers are followed by vigorous shoots starting from the base of the plants, and these must be suffered to grow unmolested until late autumn, when they may be treated in the same way as the strong rods of the previous autumn.

No pruning will be required the following spring. Two winters after planting the hedge will be an object of intense interest and satisfaction to its owner.

For table decoration these single flowers are delightful, light, pretty, and fairly lasting, and from such a hedge as I have endeavored to describe they may be gathered in barrow loads, on long elegant stalks, without injury to the plants.

I append the names of the complete set of sixteen varieties raised by Lord Penzance; and add that to the qualifications I have mentioned, these Roses may also be planted singly on lawns and in shrubberies, where they will flower freely and last many years.

Amy Robsart, lovely deep rose; Anne of Gierstein, dark crimson; Brenda, maiden's blush or peach, dainty in color and shade; Catherine Seaton, a very pleasing tint of soft rosy pink, the bright golden anthers being very prominent; Edith Bellenden, pale rose, flowering profusely in clusters; Flora McIvor, pure white, blushed with rose; Green Mantle, bright rich pink with a band of white encircling the anthers, which, with their background of white, have a very pretty effect; Jeannie Deans, very large scarlet crimson, semi-double, flowering freely in clusters; Julia Mannering, the prettiest of all the pink varieties; Lady Penzance, copper, with a peculiar metallic lustre, the base of petals being a bright yellow; Lord Penzance, soft shade of fawn or ecru, passing to a lovely emerald yellow in the centre sometimes toned with a delicate pink; Lucy Ashton, pretty white blooms, with pink edges; Lucy Bertram, a fine deep crimson, the richest color of all, centre pure white, showing the bright yellow anthers to great advantage; Meg Merrilies, gorgeous crimson, very free flowering; Minna, large pure white, opening with a tint of palest blush; and Rose Bradwardine, beautiful clear rose, perfect in shape.

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A Blue Rose

grown by a head gardener named Macdonald, in the United States, has been sent to Kew Gardens. As a rarity it may claim rank with the choicest new orchid, and it is, therefore, not surprising to learn that on the way over the Atlantic it received the most careful attention, and was protected in a specially constructed miniature greenhouse—a care which was rewarded by its arrival with blooms in excellent condition.—"B. Weekly."

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Rose for the Rock Garden.

ROSE LAMARQUE.

One of the most beautiful of white Roses that I have seen for a long time was the old Lamarque that was rambling all over a cold house, where it was evidently quite at home. The long growths of last year, studded at every joint with beautiful buds and some more fully developed blooms, had attained a a great size. As a variety to come in after Niphetos is over, and just before the outdoor blooms can be depended on, this kind will well repay the shelter of a glass roof, for in the case mentioned the glass lights had only been erected to cover in a spare corner where but little direct sunshine reaches it.— J. G. GOSPORT, in "The Garden."

THE MALVERN GARDENS.

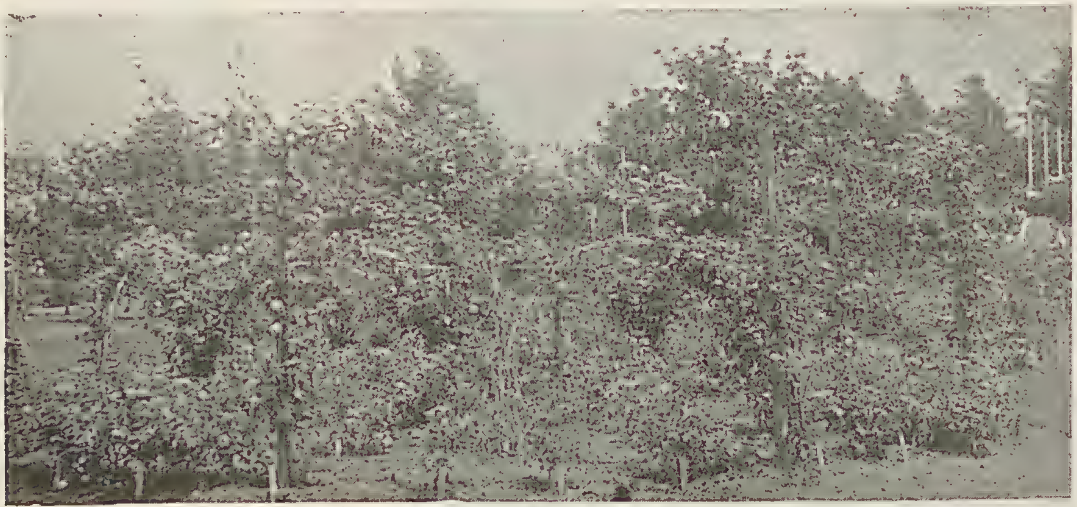
These gardens are attractive at all seasons, but when the Roses are in flower, when the water garden is at its best, and the trees are radiant in their spring foliage, they are quite irresistible. On that broad expanse of lawn one can breathe freely, and enjoy to the utmost the extensive view it commands of the surroundings. On this particular morning there was just enough breeze to silver the poplars, and to make the long grass shimmer, just enough sun to intensify the colors, just enough shadow to multiply the tones. Through the dark pines a little distant, delightful vistas of sunny uplands, with scattered red-roofed cottages, an occasional cyprus, sentinel-like, dark and grim, but picturesque, undefined masses of soft foliage, hollows veiled in blue mist, beyond all the ranges ever so faintly blue and melting into the distances. Here, then, are the advantages of the situation, this view that lends such enchantment to the scene and the slope of the gardens by which the effect is so wonderfully enhanced; no uninteresting, impossible dead levels to deal with, but a rising ground lending itself to artistic treatment. This is no doubt due to the wise forethought of Mr. Pockett, to whom they owe their existence.

What an adept in the art of innocent deception the landscape gardener is. Here, for instance, the eye travels over the cool green turf where the clover is coming out

"In constellations on the lawn"

over multi-colored flower beds and a perspective of small lawn and soft shrubby things, amongst which the unique blue of Ceanothas divaricatus stands out in high relief. Beyond all a distant vista framed in soft foliage, a vista of delicate green and vague intermingling tints, and the rich glowing crimson of Mesembryanthemums. It might be miles away, the effect is so admirable. In reality, it is not much more than a stone's throw. It is only one of many peeps. This is a happy hunting ground for the artist and photographer.

What a depth of shade under those oaks. They have not seen fifteen summers in these gardens, and yet they almost cover the pink gravel path that goes winding, winding in and out in a serpentine line till it loses itself among the trees. Golden oaks and variegated Coprosma give a brilliant touch of gold to the foliage. Kleinia is made effective use of as a border plant; in color not glaucous quite, and yet not blue nor grey. It forms a subtle contrast to the warm greens with which it is grouped. Yonder is another charming border plant not often used for the purpose, the



Malvern Gardens, Victoria. View of Rose Garden, showing method of training Roses.

Malvern Gardens. View of Water Garden.

New Zealand Daisy. Of course, it rejoices in a long botanical name besides, which I will omit, as I bear the plant no grudge, only profound gratitude and admiration, because it flowers for about nine months out of the year. At present it is a pinky-white mass of diminutive blooms. It encloses a bed of yuccas and pampas grass, and forms a little solid rampart at their base, where, if there are any defects, as sometimes happens with the best regulated yuccas, they are mercifully concealed, and the whole effect is excellent.

Wandering here and there over the soft turf, the eye continually attracted by some striking group of foliage or harmony of color, compelled to pause in admiration before a "chestnut with a thousand lamps," a perfect hemisphere of fresh green foliage and roseate blooms, the water garden is reached. This has quite a Japanese effect. The stonework has been so constructed as to give the impression of having been irregularly carved by the action of the water and the hand of Time. In one place it projects in a sharp, rugged promontory; in some cases clothed with a thick growth of Virginian creeper; in another it recedes in a deep bay. Somewhere about the centre the lake is partially crossed by a bridge of stone, on which is a thick growth of vegetation, mingling with the bold outline of Aloes and the Wistaria, whose lingering blooms reflect themselves in the water below. The foundation of this structure seems to have been undermined by the action of the water, and through these natural openings is a peep of Golden Iris and their broad, shimmering leaves, ranging higher and higher until they rise out of sight. Irises, including the noble Koempferi, and a luxuriant Papyrus occupy little islands dotted about, and the water is completely covered in parts with varieties of Nymphaea. During the month there will be hundreds of blooms afloat, and what a sight it will be. Just in time to see a rambling bust of Fortune's yellow before its blossoms fall. It grows right on the water's edge, and is one sheet of flower from top to base. It throws a blurred reflection of pinky yellow into the lake. Beside it, vieing in purity, if not quite in beauty, a sister from China, Fortuniana, almost a dazzling gleam of white. It only needs the palms growing in rich profusion about the margin of the water to complete this Eastern picture.

And now to the "Gardens of Gül in their bloom." La belle Rose has very wisely been made a specialty, and a portion of the space consecrated to her sole and sacred use. Here they have the full benefit of the morning sun, the pure, ambient, uncontaminated atmosphere of the requisite amount of protection and repose. As a mark of their appreciation of these considerations they grow. How they do grow! That is the delightful part of it—not a suspicion of aphis, and every bit of wood covered with flowers or big, fat promising buds and broad, generous leaves. The plants range in size from modest brilliant Princess de Sagan to tall pillars for their back. There are rustic devices for their support, about which they fling long loving arms. They are arched, arcaded, and festooned from pole to pole, through, over and under which peeps and vistas of more Roses—a bewildering, dazzling display. An attempt to describe them individually would be almost presumptuous, for when it comes to this even their most ardent worshippers have to drop from the height of their superlatives to abrupt succinctness, thus: "Cupped, imbricated, deep crimson, very free," leaving a world to the imagination.

There are some Roses that were evidently born to high places, having heavy pendulous blooms. If you gaze up at them in awe and reverence they will condescend to reveal their charms. Marechal Neil and Niphetos are notable examples. They demand an arch or a pillar. If they are placed low one must lift their heads to admire them. This seems rather a liberty, caressing them under the chin as it were. It was observable in this rosarium that their respective habits had been carefully considered.

Belle Siebrecht was so conspicuously lovely that she must have a word all to herself. When she crossed the Atlantic some years ago and took up her abode in this country, the Americans got very excited about her, and paid astonishing sums for single blooms, and when we see her here, grown to perfection, the flower a deep rich pink, the petals curling back after the manner of the most approved La France, standing head very erect on a stout, sensible stem, large handsome leaves, and the bush covered with equally beautiful blooms and large swollen buds, she seems to fully justify her popularity. And there is Viscountess Folkeston and Salamander, and so on and so on. One feels instinctively for a notebook and pencil, but where to begin and where to stop; and each year adds at least another line to the catalogue, another embarrassment to one's choice, another pang to one's poverty of space and pence.

Malvern Gardens. Nymphaea in the Water Garden.

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Soursops.—How to rid your garden of soursops, is no doubt a vexed question. Constantly turning up the ground is the best remedy. While doing this a brood of strong healthy chickens will help you materially. Get a wire-netting coop without a bottom, and place it on the ground you have just turned up. While you are digging, the chickens will keep pace in scratching and devouring the bulbs. The coop is easily shifted as you work along.

The Orchard.

Operations for December.

The question of conservation of moisture is a very important one in a season like the present. Where soil is well enriched with humic matter the sun and winds have far less power to rob it of moisture, but where it is light and dry the little moisture it may possess is soon licked up, and the surface is swept away in clouds of dust. No time should be lost in mulching the trees where it has not been done. The wise grower will have provided himself with material for that purpose. He has had the whole year in which to collect it. In the absence of a manure or littery mulch there must be an early mulch. The soil must be continually loosened to keep down robbing weeds, to prevent evaporation, and to break up the capillary tubes by which moisture escapes.

The soil around citrus trees must also have caught attention. The subsoil must be kept moist to encourage a deep root system and to enable them to grow freely throughout the summer. The fibrous sorts only should occupy the surface soil. In irrigating these trees the water should penetrate to the subsoil and give it a thorough soaking. Hoe the surface well, and then mulch with well spent manure or lawn mowing; avoid any manure in an active state of fermentation.

Sickly citrus trees are helped and strengthened by an application of superphosphate or bonedust. The trees will require light pruning. Thin out the weak fruiting twigs, remove crouching shoots and all growth that threatens to fill up the central space and exclude light and air from the tree. Thinning is seasonable work in all departments of the orchard. Thin out the crops of apricots, peaches, apples, and pears so as not to put the tree to the expense of ripening too large a crop, and also to increase the size and flavor of the fruit that is to remain. Remove all badly placed and superfluous shoots. Select the best placed growth where it is desired to extend the shape of the tree. Thin the leading shoots of all trees to prevent them from forming a hood and shutting out light and air from the tree, and also monopolising the sap at the expense of the lower portions. It is still too early to prune to promote weak fruiting wood. Allow the trees thorough soakings of water occasionally to swell the fruit, but do not overdo it to the extent of making them watery and flavorless. Thin out gooseberry crops at an early stage. Remove the crowding and central shoots from currants and gooseberries, that the bushes may be sufficiently open. Remove the weak and superfluous canes from raspberries, and mulch with a rich manure.

Give water and liquid manure to strawberries after the effort of fruiting. They should previously have been mulched, and remove the runners, otherwise they will weaken the parent plant.

Continue to spray trees that are infested with insects. Weak Bordeaux mixture will be found a pretty general remedy at this season. Place bandages round apple trees now to trap the codlin moth larva as it makes its descent from the fruit.

Thin out the superfluous shoots on vines, allowing just sufficient to remain to furnish next year's crop, and to act as a partial shade. Stop the fruit bearing shoots at the second or third joint beyond each bunch. Thin out the bunches and the berries. Thus the ripening will be hastened, and better sized quality ensured. In the case of trellis and house trained vines, see that the wall is covered with useful wood for present and future use. Remove shoots that have a tendency to cross and overlap others. Towards the end of the month give the vines liquid manure or dressings of bonemeal, old mortar, and well rotted dung or spent cow manure as a mulch. Keep the soil around them clean, sweet, well aerated, and free from weeds. Destroy all caterpillars, either picking them off by hand or by spraying with an arsenic mixture.

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Pure Grape Juice.

There will be thousands of tons of grapes all over the country ripening this year, that with great profit might be turned into grape juice and kept on the farms where the grapes are grown. On this subject H. E. Van Deman says: Fresh grapes are very nice, and every one enjoys them in season, but they do not last long enough. We should try to prolong their season by every practical method, such as cool storage in our fruit cellars, but there are many months when the pure juice free from all fermentation and drugs will be very acceptable. Nor is it difficult or expensive to make.

The old way, and the one that we followed at our house for many years, was to take the grapes off the stems and heat them before pressing. This made a dark and murky juice, which we made still more unpalatable by adding sugar to it. We heated it to the boiling point, bottled it, and thought it a delicious drink; and so it was. But we have found an easier and cheaper way to make a better article.

The new way is to put the fresh clusters, after all bad berries are taken off, into a cider press, with a coarse cloth next the cage, and press out a part of the juice very lightly. As soon as it begins to get dark red the pressure should stop and all the juice so expressed be kept by itself and put on to heat. Test it by a thermometer, and when it reaches 175 deg. bottle it at once, without any sugar or other thing in it. If it is brought to the boiling point it will lose the delicate grape flavor and have a cooked taste. The bottles should be kept hot in boiling water and the corks, too, so that there will be no lurking germs of ferment left. Their tops should be dipped in melted wax to make them still more secure from the air.

The darker juice may be pressed out as long as any of consequence remains in the pulp, but this should be heated and bottled by itself. It will not have the mild flavor of that first extracted, but some may like it better, and I have found this to be the case occasionally.

Grape juice made in this way needs no sugar at any time nor any dilution when the bottles are opened. It is mild and entirely harmless. There is no beverage that is better for the sick or well. Every gra grower can have it at little cost. It essence of the grapes without the bothersome and useless seeds and skins.

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Ringing the Currant Vine.

TO THE EDITOR

Sir—I notice that the advocates of this system are modifying their views. At first it was to increase the crop; but being of an inferior quality, they now advise narrow ringing to improve the setting. As an old, experienced gardener, I will give my views, and try to explain a few points that appear to me to be wrong in the system of ringing so strongly advocated. The champions of the system of ringing admit that it injures the vine by robbing the roots of their share of sap, to make extended root action, thereby diminishing the supply for later on in the season, when the vine needs it. But to avoid much damage they recommend a narrow ringing that will close up in a few weeks. What for? They say to induce setting. This is a fatal mistake. The setting all depends on the weather. In a vineyard, when the vines are in flower, all the air possible is given, and the atmosphere kept dry, for pollen to blow about and fertilize. The same thing applies outside. Another assertion that is wrong re stopping of vines is to make them set. It is really to induce the flow of the sap to the berries, instead of it all going to growth, and not one stopping, but continuous. The first rush of sap will always go to growth, and the more growth the more the same is demanding and neglecting the berries if not stopped. Another old dodge which acts similarly to ringing is to twist a bit of copper wire around the stem of fruit trees, especially pears, to make them set fruit buds instead of the sap all going to growth. The same could be tried with vines, and remove the wire when the desired result is obtained.

It is admitted that you get an inferior article by ringing. For goodness sake let Australia get a good name for quality of its product. I go further, and say the fruit is not fit for consumption. It will give children pains and diarrhoea and set them against currants in any kind of food. Both cakes and puddings have an unpleasant acid when made with these artificially produced currants. Mothers, if wise, would not have them at a gift. The reason these currants are injurious is that the circulation of the returning sap is stopped, and the leaves, stem, and fruit are overcharged, so that the natural deposit of sugar cannot take place, but a lot of what I call unconverted sap remains behind instead of passing on in circulation. This is poisonous, as all unconverted sap is. In my opinion, it is wrong to advise anyone to ring vines. An old experienced grower may sometimes resort to some of these tricks of the trade at particular times and seasons, but I would rather depend on more natural methods of cultivation. An observant vinegrower will always know just what the plant requires. You cannot make any rules, because circumstances of climate, soil, seasons, &c., vary so much. The Greeks do it no doubt to get a good sample to sell.

I am, Sir etc.,

NATURE.

[We are exceedingly pleased to publish this letter and trust that others who know as much upon the subject as our contributor, will favour vinegrowers with their views upon such an important matter. This trade is in its infancy, comparatively, and any unwise action upon the part of vinegrowers at this stage may lead to serious results from a commercial point of view.—Editor.]

Fruit Notes.

Raisin growers in California are apprehensive that a record crop promising this season will bring down the price, and the Raisin Growers' Association of the State are proposing to borrow £100,000 to enable them to make liberal advances on the whole crop on delivery, say 75 per cent. of the sweat box value. This seems to us a risky procedure unless the Association is sure of being able to control, say 80 per cent. of the total output of the State.

Apples for the German market from France, Italy, and Austria are wiped with dry cloths, each apple wrapped in soft, porous papers, and snugly laid layerwise in casks lined with paper, and having openings cut in the ends and heads to secure adequate ventilation. American apples in barrels similar to those sent to England, and nether wiped nor wrapped, have met with a poor reception in Germany, and prices realised in many cases did not pay expenses, while the Continental apples, carefully packed, fetched good figures.

Germany should be tested as a market for Australian apples. There is no doubt she could take a large quantity, as notwithstanding the immense quantity grown in the country she still imports £1,750,000 worth of fruit.

* * *

Slugs.—Lime dusted out of a bag is the best remedy we know of.

The Vegetable Garden.

If the season continues dry it will necessitate frequent watering in the vegetable garden. Let the soil be thoroughly soaked, and thus encourage a deep root system in the vegetables; mere sprinkling is not sufficient. Weed the beds, hoe the surface well, and where it has not already been done, spread a mulch of manure or some suitable litter.

Seeds of French beans, pea, carrots, turnips, beet, and spinach can be sown for a succession. It is a good plan to sprinkle superphosphate over all drills, trenches, and beds prepared for the reception of vegetables. Celery can be planted out in the trenches. Lettuce can be sown between in a rich, moist soil. With plenty of water and attention it is possible to keep up a supply of salads during the hot months. Discontinue cutting asparagus in good time, and give the beds a good soaking of water, liquid manure, or a dressing of salt. Give rhubarb beds also water and liquid manure at regular intervals. Onions that were sown in the autumn are now ready for harvesting, the leaves having turned yellow. Take the opportunity of pulling them when they are quite dry, spread them out until absolutely dry, cut the leaves off within a few inches of the bulbs, and store them in a cool, airy position. Plant strong young tomatoes for later use, and give those more advanced a liberal mulch and watering. Do not swamp the plants, but let the soil around them be permanently moist. Confine them to a single stem, and secure it firmly to a stake by raffia tied in several places, and pinch out the laterals as soon as they appear. Mulch and water liberally marrows, cucumbers, and the various squashes. Regulate their shoots and peg them down. This will shelter the roots and also strengthen the plants.

Continue to make fortnightly sowings of radishes in moist, shady positions. Sow parsley for winter use. Old plants can be kept in excellent condition if not allowed to seed.

All vegetables as they advance are benefited by application of liquid manure. It promotes flavor, and the requisite size, and also enables them to complete their development quickly.

Asparagus.

More attention should be paid to the cultivation of this most desirable vegetable, and to those desirous of cultivating it upon a large or small scale perhaps the following notes may be of interest:

The soil best suited for it is a rich sandy loam, although it will thrive upon heavier soils, as is the case at Bathurst Farm, it being grown upon rather a heavy clayey loam made friable by applications of well-rotted stable manure. The land should be trenched from 2 to 2 ft. 6 in. deep, and thoroughly mixed with well rotted manure.

To save time it is better to purchase strong shoots which have been raised from seed two seasons previously. If raised from seed it would be the fourth season before strong heads would be produced for cutting. The beds are thoroughly prepared during the winter for the reception of the roots towards the beginning of spring, for if planted too early a number are apt to die. The beds should be 4 ft. wide, with paths about 2 ft. between, to allow of cutting without treading upon them. Two drills should be opened upon each bed from 18 in. to 2 ft. apart, and the roots carefully spread in them about 1 ft. apart, and the crowns covered by about 2 in. Care should be taken not to expose the roots more than is necessary. The beds are then neatly raked over and a top-dressing of coarse salt applied, which is washed in by the rain. If strong roots were planted a cutting could be made the second season after planting, which would be in about fifteen months. The old method of cutting the young shoots several inches below the surface has given place to the method of allowing the shoots to grow from 5 to 6 in. high, which are then cut off level with the beds; this allows of the whole of the shoot being eaten, instead of only a portion, as by the former practice, and prevents injury from cutting other shoots below the surface. No stems should be allowed to grow during the cutting season, which should last from six to ten weeks, according to the vigor of the roots. If continued too long the plants would be considerably weakened. After this they should be allowed to grow, in order to store up nutriment in the root and give out shoots the following season, and should be kept free from weeds and receive liberal treatment with liquid manure and salt throughout the summer. After the stems have turned brown in the autumn they are cut close to the bed and removed; the beds are carefully forked over and given a good dressing of well-rotted manure several inches in thickness. In the early spring the beds are again forked lightly over, tidied, and a dressing of salt applied. If carefully tended the beds will remain productive for many years.

If the asparagus plants be raised from seed it is preferable to only plant those which bear unproductive flowers, as the seeds produced by productive plants readily germinate and dirty the beds. Several varieties are under cultivation at this farm, including Connover's Colossal, Efurt Giant, Camden Park, Almera, Mammoth White, Giant Dutch, and Pallmetti. Up to the present Connover's Colossal has proved the superior—over an acre is under this crop, and it has proved a payable one.

The medicinal value of this vegetable has long been recognised; its diuretic properties make it valuable for affections of the kidneys. No garden is complete without a bed of it.—R. W. Peacock, Experimental Farm, Bathurst, in the "Agricultural Gazette," N.S.W.

REVIEWS.

KERNER'S "NATURAL HISTORY OF PLANTS," WITH BOTANICAL NOTES.

BY "S."

[We shall be pleased to review any books, magazines, or periodicals dealing with plants sent to us for that purpose.—ED.].

After describing the propagation of Cryptogams, Kerner goes on to the fruits of flowering plants. This branch of botany, Carpology, is a most interesting one, and may be studied with the help of the large carpological collection in the Museum of the Botanic Gardens. It must be remembered that "fruit" in botany is not restricted to edible fruits, but comprises all seed-containing structures.

Kerner then takes up Stamens and Pollen. Pollen grains vary very much in appearance, and are excellent microscopic objects. See "Edgworth on Pollen" for illustrations of these.

Hay fever is often attributed to the pollen of the Cape Marigold. If so, I think it is not due to the pollen grains themselves, but to their contents. The effect on the eyes is more like that of a caustic fluid than of a rough grain.

As might be expected, Kerner devotes considerable space to the devices by which insects are induced to help in the dispersion of pollen. The allurement is generally honey secreted by various parts of the flower—the petal, sepal, stamens, carpels, and by special nectaries. From these it frequently flows into receptacles, pouches, and spurs provided in different parts of the flower in such positions that the insect, in gaining access to them, necessarily rubs off the pollen, and subsequently deposits it on the stigma of another flower. The many contrivances for accomplishing this are detailed in modern books on Botany, from Darwin onwards, and need not here be particularised. The other branch of the subject, the means by which insects useless for pollination purposes (such as ants) are kept away from the honey, is fully worked out in another of Kerner's books, "Flowers and Their Unbidden Guests." Both branches of the subject are particularly fascinating, but need diagrams or the flowers themselves for their elucidation.

To facilitate the finding of honey many flowers have not only brightly colored petals, but special "honey-guides," or distinct markings leading to the nectaries. Dietes Bicolor, a common plant in our gardens, is a good example: here the petals are yellow, the honey-guide black, leading just under the petaloid stigma. In Kennedya nigricans I notice that the honey-guide, in this case red on a nearly black ground, only shows itself when the flower approaches maturity. On the other hand, when maturity is passed the fact is indicated to passing insects by the petals changing color.

It is interesting to look round a garden to note in what diverse ways flowers render themselves conspicuous to the insects that may be of service to them. If the flower be pendant, as in the Fuchsia, the outside is brightly colored: if turned upwards, the inside. Sometimes, as in the Poinciana, the stamens are long, protruding, and conspicuously colored: the Bottle-brush is a good example of brilliant stamen filaments. Bracts, as in Bougainvillaea, are sometimes as brightly colored as flowers. Look, too, at the colored corona in a Passion flower, or the Narcissus Poeticus.

But flowers have to consider the special likings of particular insects: thus bees prefer blue and violet, do not care much for yellow, and less for scarlet. In this case it is suggested that perhaps bees are color-blind to red, and do not really see it as a distinct color.

Night-flying moths are most readily attracted by white or pale yellow flowers, and these generally supplement their allurement by special odors. I notice, for example, one of the Tobaccos, Nicotiana affinis, opens its large trumpet-shaped flowers of an evening, and then only is its fragrance observable; whilst it is thus rendered attractive to useful moths. I note that its stem exudes an unpleasantly smelling sticky substance, presumably to keep away useless ants.

But not all odors attractive to insects are pleasant to man. Flies appear to like the Stapelia and the spotted Arum, but gardeners call the latter the "Dead-dog Lily." Hawthorn, pear blossoms, and Diosma flowers are almost intolerable to man from the Trimethylamine they exhale—an odor comparable to bad fish or herring brine.

TIME OF OPENING AND CLOSING, AND DURATION OF FLOWERS.—Here there is much to be noted. Ipomoea opens at 4 o'clock in the morning, flax between 5 and 6, Tulips between 9 and 10, and so on until noon. In the latitude 47 deg. N., where Kerner wrote, no plant opens during the afternoon: How is it here? At 6 p.m. the Honeysuckle opens, shortly followed by the Evening Primrose, which may be said to burst open, the operation taking less than half a minute. Between 7 and 8 the Marvel of Peru, between 8 and 9 the Tobacco (already mentioned), between 9 and 10 the night-flowering Cereus. Some flowers last but a few hours, such as the Portulaca; others keep open for days or even weeks. Thus a single flower of the Cyclamen will last for 10 days: some Orchids for one, two, and in the case of Odontoglossun Rossii, nearly three months.

ARRANGEMENTS TO PROMOTE CROSSING OF FLOWERS.—This was well threshed out by Darwin, and the conclusion he arrived at was that cross-fertilization was a great advantage to plants. His conclusion is accepted as far as its being a temporary advantage, but even his own experiments showed that after a time the benefit fell off.

The arrangements in nature to avoid self-pollination are very numerous: the anthers and the stigma ripen at different times: the anthers open on the side opposite the stigma: the stigma overtops the anthers: anthers are in one flower or plant: the stigma in another: and so on.

If self-pollination is successfully avoided, Kerner shows the numerous contrivances to secure fertilization from neighboring or distant flowers; but if, after all these fail there are equally curious arrangements to fall back upon self-fertilization. Kerner may well call this a "marvel of floral construction."

"In Crocus albiflorus the anthers at first rest with their arched backs in contact with the stigma, and in this position cross-pollination is no doubt effected by insects. But towards the close of the flowering period the anthers are twisted round, with the result that the pollen touches the stigma.

In the Snowdrop the flower is pendant, and the stigma projects beyond the cone of anthers; failing cross-fertilization the pollen at a later period falls upon the stigma.

In the Aponogeton, grown here as a favorite water plant, the anthers are at first below the stigma, but later on the filaments grow and bring the anthers up to the stigma.

In Saxifrage one only out of the five filaments thus grows up when needed, the others remaining below the stigma.

The Willow-herbs are in the morning suited to cross-pollination; in the evening, when the filaments are elongated to self-pollination.

In Azalea the anthers at first stand away from the stigma: later on they approach and touch it.

In Cactiform plants the stigma is above and out of the way of the anthers at first, but after a time the style contracts and draws the stigma down on to the anthers.

When a Campanula flower opens the pollen is already shed upon the style, but the upper surfaces of the three stigma lobes are horizontal and out of the way of the pollen below: when the flower is older the stigma-lobes roll back, and the inner surfaces touch the pollen.

Passing over numerous other contrivances to effect the same purpose, we come to one so simple as to be overlooked.

At the last stage of the flower the corolla becomes detached, and, slipping over the style, drags the anthers over the stigma: verily a last chance.

Pollination leads to fertilization. The pollen grain lying on the moist stigma puts out a tube, which grows downward inside the style, enters the ovary, creeps along its walls, and, finding an ovule, enters by the little spot called the "micropyle" ("little gate"). This is the usual method, but in the sheaoak, birch, hazel, and some other trees the pollen tube passes through the substance of the ovule, and does not make use of the little gate.

(To be Continued.)

"The Australian Gardener."

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Press Opinions.

"The August issue of 'The Australian Gardener' is an excellent number."—*S. A. Register.*

"While 'The Australian Gardener' deals mostly with the cultivation of flowers and fruit, it does not neglect other phases of gardening operations, which, with scientific botany, are dealt with by a careful selection of contributors and specialists."—*Mt. Barker Courier.*

"'The Australian Gardener' is excellently printed and illustrated, the illustrations being specially fine. It consists of twenty pages, and contains much useful information."—*The Laura Standard.*

"'The Australian Gardener' is a new monthly journal for the special information of those who are interested in all branches of horticulture, and serves to give a higher class of instruction to amateurs than is usually provided in this class of journal. It is well got up, and is published in Adelaide."—*Omeo Standard* (Vic.)

"'The Australian Gardener' tells you exactly what you need to know each month; its information is from the best sources; it is well printed, and the subject matter is well arranged. The August issue is of special interest to gardeners in public and private grounds, and also to those who find pleasure in pretty surroundings for the villa or cottage. The articles are 'Garden operations for the month,' 'Bulbs,' 'Carnation growing in America,' 'Cinerarias,' 'The Fuchsia,' 'Ornamental Shrubs' 'Hints for the Glasshouse,' 'The Flannel Flower,' 'Magnolias,' 'Cyclamens,' and 'Transplanting.' There is also a fine article dealing with the United States experiment stations that have made America a phenomenon in the natural history of the world. The magazine is a marvel of cheapness."—*Cobden Times* (Vic.)

'The Australian Gardener,'

A MONTHLY JOURNAL OF FLORICULTURE
AND HORTICULTURE, FOR PROFESSIONAL,
PRACTICAL, AND AMATEUR GARDENERS.

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Manager for the Proprietors of "The Australian Gardener,"
61, Brookman's Building,
Grenfell Street, Adelaide.

The Australian Gardener.

THURSDAY, JANUARY 1, 1903.

EDITORIAL.

We have pleasure in presenting our compliments and very best of good wishes to the readers of "The Australian Gardener." We do so in the spirit of gratification for the splendid support they have afforded in the past, and the encouraging help offered for future work. At the beginning of our publication we were convinced that the public of Australia would agpreciate information upon gardening in all its beautiful phases of work and interest. Our experience intensifies this conviction. We believe that no country in the world has a keener inherent love of Nature than Australia, and it only requires direction and a little inspiration to work the people up to an enthusiasm, such as is witnessed in the old country. Australians have everything in their favour for growing flowers to enjoy, and to send to the markets of other countries. In fact the growers in Australia are awakening from a long slumber upon their opportunities. The prime products of wheat, wool, and minerals have received the concentrated attention of the commercial people, and it is only during the last few years that anything has been done in the matter of wine and fruits. Now we would suggest that more attention might be given to an exchange of the products of the floricultural world. The climatic conditions are favourable to the production of everything of value in the Northern Hemisphere. Why should we not supply the old world markets. We leave the suggestion with those in the trade who are able to cope with it.

The Commonwealth has been through troublous times, but no national life is able to more quickly and surely combat adverse conditions, and with the birth of 1903 the prospects of future prosperity are reassuring. With dauntless courage and high hope we begin the New Year. To all in the trade we wish success, whether producing for profit or pleasure, or in the literary world, disseminating information, and to all our readers interested in the most beautiful handiwork of God in Nature, we sincerely wish

A Happy New Year.

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PER YEAR.

Garden Operations for January.

THE FLOWER GARDEN.

There should be no lack of color in the garden in January. We are now being rewarded for the year's labors by a wealth and profusion of bloom. We have but to maintain it through the hot trying months to follow. The operation of watering has become tedious and monotonous in the extreme, but if anything can afford us consolation it is the magical effect it has on drooping flower and flagging leaf after blistering sun and withering wind have done their worst. There is often a lull towards evening, and in the softening light that follows the sunset, in the moisture laden atmosphere we have credited, when the cooling spray of the hose has called back the color to the plants with an additional intensity, and caused a perfumed incense to ascend from every flower, we are permitted to enjoy those rare moments of peaceful enjoyment. Moments worth waiting, worth striving for. Dahlias and cannas are a host in themselves for decorative purposes, but the luxuriant growth and wealth of blooms we desire above all things in them can only be encouraged and maintained by liberal supplies of water. In the case of the former, where the soil has not been well enriched frequent supplies of liquid manure should be given. Dahlias must be secured to stout stakes, one to each stem; their effect is spoilt at once if they are allowed to flop. With smaller annuals it is better to rely on close planting, by which they support each other, and due attention to strengthening growth by pinching than to have the garden bristling with stakes. Cuttings can now be taken of verbenas, phloxes, antirrhiniums, pentstemons, lantanas, pelargoniums, petunias, and the side shoots of pansies and hollyhocks. Choose nice short-pointed wood for cuttings. Carnations and verbenas can be layered now to increase them. Seeds of antirrhiniums and delphiniums can be sown this month for planting out in the autumn, and also of Brompton and intermediate stocks; the two last-named in the open border, where they are to remain. If seed vessels are to be saved they must be carefully watched as the ripening season approaches, but if a prolonged period of bloom is desired the plants should be relieved of all dead flowers.

The planting of bulbs that have been lifted may be begun within the next few weeks. Many varieties are positively injured by remaining too long out of the ground.

If mulching has been neglected the flower beds must be constantly hoed and weeded. Lawn should be frequently mown, so that the growth will be kept close and fine and even. Give then manure occasionally to stimulate the growth. An occasional sprinkling of wood ashes is said to be very beneficial.

Allow no gaps to remain in the borders, as they seriously mar the general effect. Substitute failures with plants kept in reserve for the purpose, and fill in spaces and bare patches with annuals of free and rapid growth. Make note of any errors in grouping, or, on the other hand, of any striking and successful effects that may have been accidentally obtained. Closely observe the relative heights, the spread, habit, and character of all plants; also their colors, any similarity there may be shade or form, their period of bloom and its duration to aid in future grouping and arranging.

Perennial phloxes are among the most decorative things in the border. They are gross feeders, and amply repay a rich soil and abundant supplies of water. The best blooms are produced on two and three year old plants; after the fourth year it is advisable to make a fresh planting. Stronger and better plants result from cuttings than from divisions. Pinching and cutting back the shoots will induce them to bloom well on into the autumn.

Roses can be budded during this and next month. Take buds from those it is desired to propagate, and insert in a seedling briar stock. In some cases, with Marechal Niel for instance, the Banksia can be employed. Tea roses judiciously pruned at this season will be encouraged to produce better blooms in the autumn. Much of this pruning can be done when the flowers are cut if care is taken always to cut back to a strong outside bud. Many plants can be induced to bloom continually if they are occasionally sheaved over. It is generally easy to see when this method will answer by the fresh growth that is always found springing up from the base. Coreopsis and antirrhiniums can be thus dealt with.

Cockscombs, with their rich and varied tones and unique character of growth, are admirable little border plants. Plenty of sun and water are their principal requirements.

Nicotiana tabacum is a very desirable thing on account of its handsome tropical looking foliage and the ornamental flower it bears. It considerably adds to the effect of a border, and is easily raised from seed.

Answers to Correspondents.

"What's in a Name?"—Botanical terms are exceedingly appropriate, but rather trying to non-classical readers. Thus, flowers are classed as Anemophilous and Zooidiophilous, according as they are pollinated by the wind or by animals. If this is done by birds the flowers are termed Ornithophilous, if by snails Malacophilous, if by insects Entomophilous. In a strikingly alliterative sentence the "Encyclopædia Britannica" states that "Anemophilous flowers are characterised by the prodigal production of powdery pollen."

"Hose-in-Hose."—The term applied by gardeners when within the corolla one or more others are produced. A Campanula now before the writer has six corollas thus superimposed, quite filling up the tube. The native Epacris impressa is sometimes found with a double corolla. Among some fine specimens of Campanula, 2½ in. long, one was formed of two corollas side by side, with double stigma and "hose-in-hose" as well. Another specimen had the outside corolla spreading, so that the flower assumed a "cup and saucer" form. The Campanula is also worth examining to see how the honey is protected. The filaments of the anthers are flattened at their bases, and meet to form a dome over the nectary. This keeps out ants, but bees can insert their proboscis between the segments.

"Gaillardia."—The tri-fid ray petals often become tubular, giving quite a different character to the flower.

"Student."—The "tepals" are the individual segments of the perianth. They, therefore, include both sepals and petals. Where these are similar, as in Lilies, Iris, &c., it is a convenient word to use.

"Crown of Thorns."—The plant to which this name is usually ascribed is the Paliurus aculeatus. It belongs to the same order as Buckthorn. It is known in France as the Porte chapeau, because the fruit resembles a head with a broad brimmed hat. The name of "Christ's Thorn" is also applied to the Zizyphus Spina-Christi belonging to the same order, the branches of which are flexible and readily plaited.

"Cucumber."—We have never heard of growing cucumbers "Indian Tepee fashion." Perhaps our readers may give some information upon the method. A "Tapee" is a North American tent, but we know of no connection between the two words as concerning the growing of cucumbers.

"A. C. Dobbie."—The small dark brown beetle that is so destructive to trees and plant life is probably one of the weevil genus Curculio, belonging to which there are a number of species, all more or less destructive to vegetation in the manner described. The two most common to your description are Curculio pomorum and C. pyri. The most successful plan of destruction is to place a sheet under the tree at night and throw a strong lantern light into the branches. The beetles will fall as soon as the light touches them, and they may be gathered up in the sheet and destroyed. Send a specimen, and we will give you all information concerning it.

A Garden in Spite of Drought

There is one section of the gardening world whose lines are cast beyond the radius of the water supply, and there is another section whose limited means keep them continually

"Dreading that climax of all human ills,
The inflammation of the weekly bills."

The water bill more especially. In the face of the dire misfortune, scarcity of water, they continue to garden during the summer with a sublime faith in Providence. They seem determined to grow the plants that are grown successfully by those more fortunately situated, or none at all. After a brief and brilliant period of bloom in the spring they have to face the perplexing problem how to maintain a semblance of brightness and verdure during the long hot dry months that follow. With the same blind faith they put out their summer annuals ,and fill the garden with their favorite herbaceous plants and shrubs, without any regard for their drought-resisting capacity and their voracious appetites for food and water, and trust to summer showers to do the rest. Before the summer is half over the garden is a ruin, the grass is brown, and the soil is white and hungry, while dead twigs and dying vegetation disfigure what should be the flower beds. This is not an exaggerated picture. I have seen such failures often. If a garden is to be the boon it should be it must in summer of all seasons refresh the eye with cool greenness and healthy growth. What is a garden? An enclosed area, consisting of paths and flower beds geometrically or otherwise arranged? Surely not! A garden is a garden by virtue of its contents, their variety and arrangement, its pleasing combinations of color and form, its conformity to Nature's principles, the diversity of its tints, the shade it yields, the refreshing sense of rest it affords, the harmony and congruity of the whole. How delicious it is after the glare of the dusty road to turn into a garden that is a cool bower of green, with glimpses of smooth lawns, pleasing curves, graceful outlines and cool vistas to greet the tired eye. A garden should be formed in faithful, but not slavish, imitation of Nature, on no matter how small a scale, her ruggedness and sweet simplicity happily blended. Nor is the drought-stricken garden prohibited from these pleasures. They are for all and sundry who are possessed of a garden plot and sufficient intelligence to make the best of adverse conditions. If he would have trees—and who would not considering the shade and protection they afford and the precious autumnal deposit of leaves from the deciduous varieties? The beautiful imported trees will not exactly withstand drought, but when once they have become well established should not be dependent on surface moisture, but if encouraged to do so will send their roots down into the permanently moist lower strata, and thus can be grown with some measure of success in any but absolutely barren soils. This applies also to shrubs. Many of the native acacias and other hardy evergreens are ornamental and highly desirable. Pines and other large conifers and the Moreton Bay trees should be strictly prohibited on a small area. The best way is to consult a reliable catalogue, and, benefiting by the experience and advice of authorities on the subject, to make a selection of trees and shrubs that are sufficiently ornamental and in every way suited to local conditions. If they will grow luxuriantly or flower profusely and make themselves happy and quite at home they will prove the bulwark of the garden, defending it from the depredations of marauding gales and the wholesale plunder of that mighty robber the sun.

Coming, then ,to smaller plants, why do people persist in the vain endeavor to grow such things as balsams, zinnias, dahlias, and delphiniums where the conditions are manifestly adverse? Year after year their hopes are blighted by successive droughts. Would it not be better to accept defeat? Nature is so strong, so merciless when she pits her strength against our puny efforts. Yet they continue to spend rare pennies on seedlings, and to put them out with jubilant hopes of a good season that never comes, while there are families of drought resisting plants, whose name is legion, that will convert all this barrenness into smiling vegetation. They come from the land of the sun, not in single spies, but in battalions, to clothe our arid wastes. Mesembryanthemums, echeveria, and all the noble host of succulents. The mesembryanthemums present a gorgeous appearance when in bloom; they are almost barbaric in their crudity of color, but wonderfully effective and brilliant. It is not only the flower that commends them, but the succulent foliage may I call it? with its richness and variety of coloring. M. cauleseus, picturesquely called the "stem-leaved morning flower," is one of the very glaucous varieties, and is extremely attractive. It has such gentle gradations of delicate tones. It will carpet a bed completely or clothe a rockery; it covers itself in the early summer with diminutive pink flowers, and is all daintiness. The more mesembryanthemums are starved the more gaily they bloom, the more they luxuriate and increase. Another that recommends itself highly is commonly known as the iceplant; by botanists, M. chrystallinum. It sounds deliciously cool, and appears so, for on the hottest day it scintillates with what appear to be dew drops, as though it possessed a secret source. We like to think of them as dew drops, but botanists tell us in their prosaic fashion that it is due to excessive development of all the superficial cells of the plant, which are like so many small bags filled with limpid water. No matter, it is a pleasing peculiarity. The cactus family are true friends in need with the exquisite beauty of their blooms. Many of them seem to be independent of water artificially supplied. The abnormally swollen stem is a reservoir of moisture obtained, we do not know how, except by some occult power of capturing moisture from the atmosphere with which to swell their tissue. It would be impossible to dwell on all the respective merits of this varied species; but their peculiar beauty should appeal to all. With this infinite variety of succulents tastefully grouped and arranged a charming and unique effect could be obtained. Rock work, if possible, should enter into the scheme. There could then be terraces, clothed with generous masses of these plants; cool recesses, shady grottoes, hillocks, mounds, and green depressions to vary the form, rocky heights and bold escarpments, now blazing with color, and anon a subdued harmony of tint. Paths should wind about, not glaringly conspicuous, invisible at a distance, and lost amid a mass of soft vegetation. The hungry soil must not obtrude itself; trailing tradescantia—green, variegated, and tinted—and soft toned mesembryanthemums should generously obscure it. Cactus, with gorgeous bloom and fantastic stems, will twist and turn in all directions, and, finally, aloes, agaves, and yuccas of all descriptions with bold outline to give height and strength and dignity to the whole.

Hawthorn.

When Foliage is Scarce.

I don't know if your readers are aware that the gypsophila, that is now at its beautiful best, can be easily kept for use in the winter. If gathered now and hung in bunches by the stalks from the ceiling of the toolhouse, it dries easily and naturally, making an exceptionally welcome appearance when flowers and foliage are scarce. I kept a good deal in this way last year, and had many a prettily decorated table. Mixed with the red berries that you can gather from the hedges till the autumn is well through ,this dried gypsophila arranged in tall green glass specimen vases has a very pretty effect. It also mixes well with chrysanthemums, whose own leaves die off much before the flowers are done.—"The Gardener.' '

A Novel Hanging Basket.

A beautiful effect can be obtained by filling rather large hanging baskets in the following manner. A wire centre should be placed in the centre. Upon this train ivy geraniums. Surrounding these plant dark lobelia to grow over the edges of the basket. At the foot of the wire that suspends the basket plant canary creeper; this soon climbs round the wire, and has a graceful effect.

Canary creepers.
Ivy-leaved geraniums.
Dark blue lobelia.
Wire cage for the centre of basket.

The colors—rose pink, blue, and yellow—are showy. The plants employed are common, it is true, but the central wire cage is a rather novel feature.

Economy in Watering.

The first step in the direction of true economy is to provide a mimic soil for the plants. This is more easily and inexpensively done than it at first appears. One has only to be thrifty with garden litter and household litter and household refuse, instead of giving it away with reckless extravagance to enrich some corporation tip, as is too often the case. It should instead be thrown into deep pits dug for the purpose, two or more if possible, so that the second may be filling when the first is already for use, and so on, and is becoming decomposed ready for use; thus no time or litter is wasted. The pits can be rendered quite inoffensive and sanitary if they are regularly sprinkled with lime and layers of soil. Everything of a speedily decomposable nature can be thrown in. They will soon fill up, and the result will be a constant supply of rich, composite humic soil with which to enrich the garden beds. This rich store of moisture having been transferred to the garden, should be further protected from waste and the robbing influences of summer by a mulch spread early or late, according to the nature of the seasons, whether wet or dry.

Efficient drainage is another important provision, because it equalises conditions by rendering the soil drier in winter and more moist in summer. Plants in a badly drained soil are put to severe extremes, and having suffered from excessive moisture and coldness in the winter, are all the more sensitive to the summer heat and drought. It must be remembered that superfluous water only escapes through the drains in summer and winter.

To group plants according to their individual tastes and native capacities is another essential to economy, and to do this it is necessary to know the place of origin of each subject—information that can be obtained from any standard botanical dictionary. Plants that like swamping and others that require little water, and in some cases are positively injured by excess, should not be grouped indiscriminately. There should also be an intelligent disposal of plants and selection of sites. The area must be taken as a whole—its aspects, situation, exposure to sun and wind, dry and damp positions taken fully into consideration, and the plants alloted places according to the suitability of the site. Summer annuals and herbaceous plants calling for liberal supplies of water should be planted within easy reach of the hose or watering can, and irises and other semi-aquatics in the immediate vicinity of a water tap, where they will benefit not only from the drip, but a larger share of moisture. Summer flowering annuals, perennials, herbaceous and tuberous sorted plants, such as zinnias, phloxes, asters, pansies, delphiniums, cannas, dahlias, and a host of others, repay copious waterings. Perhaps the next satisfactory and economical way is to give the borders containing these things good soakings of water at intervals, and then refresh the plants and cool and moisten the atmosphere with a light sprinkle every evening.

In the case of permanent trees and shrubs, strong growing creepers and climbers, whose habit it is to make a strong set of roots and a tap root with power to penetrate the soil in search of food and moisture, it is positively wrong to indulge and pamper them by continual watering. It weakens them constitutionally, and robs them of their natural robustness and the power of withstanding drought should that evil overtake them. If the water does not come to them they will go to the water. They will not starve; their instinct saves them; their intelligence, thrift, and resourcefulness prompt them to send their strong roots deeper and deeper towards the moisture that almost invariably exists in or below the subsoil. These are the roots that make the vigorous, enduring drought-resisting tree, not the roots that invade the surface soil and greedily contend with the tenderer plants for food and moisture.

Sydney Notes.

(From our own correspondent.)

Sydney, December, 1902.

The second annual general meeting of the Neutral Bay Horticultural Society was held on the 12th ultimo at "Watersleigh Hall," Neutral Bay, the Hon. Malbon-Thompson presiding in the presence of a large attendance of members. The report of the committee showed that although the local horticulturists, together with other kindred spirits, had to contend with a very trying season—both in regard to weather and restrictions against the use of the hose—they deserved congratulations for the manner in which they overcame all obstacles and staged exhibits which not only exceeded those of the previous years in quality and quantity, but compared favorably with shows of the various societies held throughout the year, and the society must rank at the present time as one of the first flight among suburban horticultural societies. In addition to holding the usual Spring and Autumn Shows, monthly competitions were held throughout the year, which proved very successful, and the support accorded thereto warrants the institution of these meetings as a permanent fixture. At these meetings different papers were read and discussed on the cultivation of various flowers, &c., thus imparting to members a fund of useful and instructive information. The Treasurer's report showed that the society's finances were in a healthy condition. Votes of thanks were passed to the Chairman, judges, and donators of prizes, and the meeting closed. The following office-bearers were elected for the ensuing year: Patron, Dugald Thomson; President, Hon. Malbon-Thomson, M.H.R.; Vice-Presidents, Alderman G. J. Barry, Alderman G. J. Barry, J. H. Beatson, Esq., J. B. Peden, Esq., Alderman J. T. Ralston, Felix Randle, Esq., J. Stavenhagen, Esq., Rev. R. H. Waugh, M.A.; Committee, Messrs. C. W. Colley-Priest, R. Cran, W. Lloyd, A. D. Peden, S. H. Robertson, F. Teasdel, and T. W. Young; Hon. Treasurer, A. R. Harrison; joint Hon. Secretaries, F. N. Camroux and R. J. Maclean.

The usual monthly meeting of the Horticultural Society of New South Wales was held at the Queen's Hall, Pitt-street, on the 9th instant. The exhibits staged were very good, and the attendance of members satisfactory. The Bouvardias were splendid, especially those of Mr. Tymms and Mr. Horton. This flower does exceedingly well here. The roses were also very good, especially so for this time of the year. Some remarkably good Cactus Dahlias were shown by Mr. Butterworth, gardener to Mr. Abbot, Croydon. The exhibit comprised blooms of Mrs. J. H. Maiden, Britannia, Uncle Tom, Countess of Lonsdale, Mary Service, Mrs. J. J. Crow, and four unnamed seedlings. They attracted much attention. Mr. Yorke was responsible for two fine specimen plants of orchids, that of Loelia purpurea being very good.

A Bamboo Basket for Conservatory or Pergola.

A very artistic hanging basket can be made as follows: Procure some bamboo rods, ½ in., 1 in., or 1½ in. in diameter, according to the size preferred. Cut the rods into lengths, for an oblong basket, say 10 by 16 in. This is much prettier than a square. The bars would be 10 in. long and 16 in. Chisel out a groove 2 in. from the end of each under rod, and nail the overlapping bamboo into it. Then attach wires from each corner for hanging. Now line the inside of the basket with moss. Then arrange Maidenhair Ferns with the fronds downwards and outwards to fill the bottom and lower sides. Cover the roots with a good compost of equal parts of fibrous peat, leaf mould, silver sand, and loam. Plant next heliotropes, light and dark, and finally crown the top with a yellow marguerite (Etoile d'Or). Carefully press the soil well around and between all the plants, water and place in a sheltered corner until settled, and you will soon have a hanging basket fragrant to the senses, graceful in form, and of a color scheme that is always a pleasure to the eye.

HYBRIDISING GLADIOLUS SPECIES.

TO THE EDITOR.

Sir—Mr. Smith's letter in the last issue of "The Australian Gardener" is not correct in many ways. In reference to the parent bulb of Purpureo-auratus, it is in no way the parent of the Nancieanus, but is a hybrid of Sandersi and Gandevensis. It is also the direct parent of Childsi. It is so named after Mr. Sanders, of England. A Gladiolus does not change its color when grown froms bulbs or bulblets. The change is only from seed. Also the first growth of small seedlings will not keep two years and then grow. They have no substance in them. The starch in them does not retain the moisture and other matter, and, therefore, life is very short. I should not like to trust them more than seven or eight months at most. But bulbs grown from bulblets will keep two years. After growing them once they are more hardy. because they grow from a bulblet which has more vitality in it at first than has the seed. Seeds will grow and bloom in from one to three years, while bulblets will take two to four years to bloom. Therefore, seedlings from seed are more tender. But life is in a greater hurry to regenerate itself.

Gladiolus Sandersi in itself is one of the most pleasant to look at. It has rather a thin stem, but the flowers are very large and wide. Mr. Smith seems to warn buyers of bulbs that the Australian grown are going back to the one-sided growth. But this is not so, as we now cross from the finest and strongest of hybrids, turning out the finest new varieties. The Australian grown seedlings will give a greater number of choice flowers per 1,000 than any other country. One American grower says that he bought 14 oz. of choice seed from a noted grower. He got thousands of seedlings. Next year he bought 10,000 from one year seedlings. From all those he says he had only 1,000 choice ones, the balance to be sold to the trade as common.

I am, Sir, &c.,

L. H. HOWELL.

Mount Victoria.

GLADIOLI IN POTS.

These splendid flowers are so decorative for a balcony or a room that they should be grown by every one, especially as it is not necessary to possess a garden for them, as they can be thoroughly well grown on the leads of a house, though it is well to arrange a shelter of wire netting over them where cats abound.

The corms of all the different groups of summer gladioli should be potted early in Spring, giving them good drainage and a compost of turfy mould two parts, to one of leaf mould, with a little soot and sand. But failing all these materials, jadoo will make an excellent substitute, and if this should be selected, 5 in. pots will be large enough; while with ordinary soil pots 6 in. across at the rim will be better, placing one corm in each, about an inch below the surface, whilst another inch of space should be allowed for watering, and a little top-dressing just as the flowers begin to show color.

Seedling Gladiolus.

From the time that growth begins the gladioli must not be allowed to suffer for want of water. During the first two or three weeks they will want none if the compost used was properly moist, unless the weather should be unusually dry. Very soon they will need a neat stake each, for they must on no account be allowed to fall about. Stakes about eighteen inches long will do, and the tall spikes should be tied to these as they grow.

The Lemoinei gladioli will bloom first, and exquisitely beautiful they are, quickly followed by the splendid Childsi and Nanceianus groups, with the brilliant scarlet Brenchleyensis gladioli to flower towards autumn. Nothing can be more effective to place amongst ferns or foliage plants, either indoors or out, and they will all open their blooms well in the semi-shade of a room if allowed to expand the lowest bloom in the sunshine. In fact, the flowers last much longer in a room than in the full sunshine, and if grouped in a verandah or a balcony they should, if possible, be placed in the shade or sheltered from strong sunshine during the heat of the day, as in this way their blooms last longer open, and do not lose their tints so quickly.

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Chrysanthemums.

EARLY-FLOWERING CHRYSANTHEMUMS.

(From "Gardening Illustrated.")

The trial of these, made by Mr. William Sydenham, has brought to light many excellent varieties of which comparatively little was known. The high quality of many of the Japanese and Pompon sorts proved the value in the open garden of the early-flowering Chrysanthemums in the dull autumn months. Some three thousand plants, in about two hundred and fifty varieties, were grown, plants being secured from almost every available source, thus making the display a most comprehensive one. The plants were put out in long rows, with a space between each plant of about 3 feet. Between each two rows of plants a good pathway was provided, and this enabled the visitors to inspect the collection with the greatest ease. Being arranged in alphabetical order, it was an easy matter to fix the name of any sort. It must be admitted that in planting in alphabetical order the best effects were not obtained. For instance, a plant some 4 feet to 5 feet in height was followed by another some 18 inches to 2 feet in height, but then the general convenience of the visitors and others was the first consideration. A fact which was apparent to all was the natural lateness of many so-called early sorts. A brief description of some of the best Japanese sorts is appended:—

Francois Vuillermet: A bushy plant, free flowering. Color, lilac-rose. Height, about 2½ ft. In flower late September.

Goacher's Crimson: A plant developing large blooms on stout, erect footstalks of good length, without disbudding. Color, rich crimson, golden reverse. Height, 3 ft. In flower during September.

Crimson Marie Masse: One of the best of the earlies, free flowering. Color, chestnut-crimson, passing to bronze with age. Habit, bushy and branching. Height, 3 feet. In flower from August till October.

Parisiana: A sparsely-flowered plant, developing larger blooms than most of the early sorts. It is a promising white sort, with long-flower stalks. Height, 3 feet. Period of flowering, September.

Chateau St. Victor: A useful plant, developing freely magenta flowers of pleasing form. Height, 3 feet. In flower September.

Bronze Prince: An English-raised seedling of proved merit. The plant is fairly free flowering. Color, old gold, shaded cerise. Period of flowering, mid-September to mid-October. Height, 3 feet.

Mons. Gustave Grunerwald: A useful plant for early displays, flowers large and of good form. Color, silvery-pink, shaded rose. Fairly good habit, free flowering. Height, 18 inches. In flower August and September.

Rabbie Burns: One of the prettiest sports from Mme. Marie Masse; a profuse bloomer, each flower on a useful footstalk. Color, salmon-pink. Habit, bushy and branching. Height, 3 feet. Blossoms from August till October.

Benjamin Guindudeau: A plant of which little has been heard. Pretty blossoms of a purple-amaranth color. Habit, bushy and sturdy. In flower during September.

Arthur Kedzie: An English-raised, promising seedling with pretty little blossoms of much value for decoration. Color, blush-pink, shaded salmon in the centre. Dwarf and sturdy habit. Height, 2 feet. In flower during September.

Albert Rose: This produces a dense mass of blossoms of a distinct shade of rose color. Habit, bushy. Height, 3 feet. In full blossom during September.

M. Leveque Pere: A very dwarf plant, developing large blooms. Color, crimson and bronze. Sturdy grower. Height, 18 inches. In flower mid-September to mid-October. This variety is considered by many to be the same as Gladys Irene Harkness.

Ernest Mathieu: This is a very bushy and free-flowering plant. Color, light salmon, shaded yellow. Height, 3½ feet. In flower from early September till October is well advanced.

Dorothy King: A very useful plant, producing bunches of reflexed blossoms. Color, deep pink, striped light pink. Height, 2 feet. In flower during September.

Doris Peto: An English-raised seedling of considerable promise. The blossoms are of good form and pure white, and each bloom has a good length of flower-stem. This variety is generally considered to be an improvement on Mychett White. Height, 2½ feet. In flower during September.

Mme. Casimir Perrier: In this plant we have a variety of high merit. Little has been heard of it, yet the plant may be regarded as one of the best. Bushy and free-flowering. Color, creamy white, freely tinted pink. It is also a flower of beautiful form. Height, 3 feet. Period of flowering, September and early October.

Louis Lemaire: This is a sport from Mons. G. Grunerwald, and partakes of all the excellent qualities of the parent; flowers large. Color, yellow, shaded orange. In flower August and September. Height, 2 feet.

Leonard Peto: A seedling from Lemon Queen, and which should be in all gardens. The plant is literally smothered with dainty bright yellow blossoms. Habit, bushy and branching. Height, 3 feet. In flower during the whole of September.

Lemon Queen: A valuable plant for late September and October displays. Flowers large and of good form, withstanding wet weather well. Color, orange-yellow. Height, 3 feet. A profuse bloomer.

Irene Hunt: In this variety we have a distinct acquisition. Its chestnut and gold color stands out distinct from all others. Very free. Height, 3½ feet. In flower during September and early October

Horace Martin: A rich yellow sport from Crimson Marie Masse. This variety is the finest acquisition to the early-flowering section for many years, and no garden should be without it. Habit, branching and free-flowering. Height, 3 feet. In blossom from August till October.

W. B. T.

◆

Stanmore Railway Station.

ITS EXCELLENT GARDEN.

Some few years ago the excellent idea originated of offering prizes for the best-kept station garden in the metropolitan division of the railway service, and the Commissioners promised to provide the money. The result has been wonderful. Stations which had previously worn a deserted appearance are now gay with flowers and ornamentatal shrubs. Passengers to and from the various stations, too, evince much enthusiasm in the work, and it is no uncommon occurrence to hear the relative merits of such and such a station being discussed. But those who leave the trains at Stanmore have the greatest to say, and their position cannot be disputed. This year "their station" has carried off the first prize, after having also won prizes in 1900 and 1901. Naturally passengers by the numerous trains which travel through Stanmore generally turn their attention towards the "crack" garden, and the sight is very pleasing. Wherever it is possible to have a plant growing, without in any way interfering with the travellers, there one can be found, while the few places which afford more scope have been made into flower beds. The Sydney end of No. 2 platform lends itself to this class of ornamentation, and flowers of all varieties are to be seen growing. Then, over the walls which surround the subway two different colored ivy plants are growing, and the blending of the colors adds further charm to the surroundings. Everything has been done well, the shrubs having been well chosen and effectively placed, and, furthermore, there is nothing in disorder. The work has been carried out by the station hands in their spare time, and Mr. Gibbons, the station master, has been freely congratulated upon the success attained. The congratulations are well deserved.

CACTI.

THE GROWTH OF CACTI IN GARDENS.

By L. GRAEBENER, Director of the Grand Ducal Court Gardens, Karlsruhe, Baden.

[From "Die Gartenwelt," October 4, 1902.]

I allow that cacti have been grown in gardens, even in botanical gardens, in many and incorrect ways, all calculated to injure the plants. In earlier times even greater mistakes were made. As a matter of routine cacti were treated, and, indeed, still are in some places, as purely desert, wilderness plants, whose habitat is sterile, stony ground, where they are exposed to the full blaze of the sun. Acting on this belief they were grown in light sandy soil, with very little water. The more nearly their native conditions were copied the better pleased their growers were. Time has taught us otherwise. By growing exotic plants we have learnt that it is not a good plan to try to imitate the original environment in part only, while we cannot imitate all the conditions, e.g., air, light, and sun, heat, &c.

We now grow plants successfully in shade whose home is in full sunshine, give good soil to those from poor ground, and water those from dry countries. This is the way in which orchids and tropical plants used commercially are grown with us, and now we treat cacti in the same way. I have worried myself a great deal about cacti, having planted them in the old way in sandy loam mixed with many kinds of small stones, keeping them dry both in the full blaze of the summer sun, and also in winter. The result was what you might expect—infinitesimal growth, withering rather than thriving, rough pale appearance, and very mean show of blossom. There are even now gardens where this plan is followed, with, of course, no good result, while in other gardens the opposite error is made; that is, sheltering plants both in summer and winter, so that they are enfeebled before spring comes.

Cacti require fairly rich soil either when grown in pots or planted out. I use a nourishing compost, mixed with sand, to which I add some loam for Opuntias, Mammillarias, Cereus, Echinopsis, and Echinocactus, and some peat for Phyllocactus and Rhipsalis. In the beginning of May I plant out badly grown or weak plants in a frame with bottom heat produced by a two-foot layer of horse manure. While transplanting I remove all old soil, thoroughly cleanse the roots, and take the opportunity of destroying any mealy bug with rectified spirit, to which a little extract of bitter gourd is added. This routine does not hurt the plants, which I then place close to the glass ,keeping the "lights" always at the same inclination. The air supply is diminished in the evening, and the frames are never shaded even in the heat of summer, when the temperature inside may rise to 122 Fah. The Rhipsalis and Phyllocactus families only are shaded at midday. The plants must be freely watered and sprinkled, and it is a good plan once a week to give a weak manure water, to which I add water in which hoof parings have been steeped.

Pot plants are treated in the same way, transplanted in April or May, and again in August, early in the month, so that they may make good roots. For tall plants I have a special frame, with glass on all sides. Pot plants must be started in heat, i.e., the frame must have bottom heat, the pots at first standing on the ground, and then, as the latter cools, are sunk in it. Well-fed plants will not suffer from cold then, being well warmed by the sun. I do not advise a second heating of the frame, not caring to grow cacti like lettuces. The situation in winter should be bright, and as dry as possible.

Pilocereus Schottii.

(From "Californian Floriculturist.")

The Phyllocacti and others from warm countries winter as well as those from colder at a temperature of 48 to 54 Fah. In winter I do not stop all watering, but only give a little, except in the case of the Stapelia family, which must be treated almost as cacti, though now they must be kept quite dry. Any one who devotes himself to cactus blooms as masterpieces should keep his plants quite dry in December, and then begin to water gradually. I am sure this advice is correct, and I am also sure that cacti at their best are in the front rank of beautiful and healthy prickly plants.

TRANSLATOR'S NOTE.—This very suggestive paper on the feeding of cacti will interest the growers of Cacti in Australia. In our country some blinding of the glass would be necessary on account of our great sun temperature during heat waves. The translator has grown many cacti on "the starvation principle," and thinks that a few experiments in Herr Graebener's treatment might lead to interesting results.

R.

Greenhouse Plants.

THE ACHIMENES.

With regard to the culture of Achimenes, perhaps the fact of their losing popularity may be accounted for in consequence of their being looked upon as subjects only fit for a stove, hence it is that attempts at cultivating them have been abandoned; but is it not also well known that, although they revel in the greater degree of heat of a stove, they can, like Gloxinias and Coleuses, be fairly well grown in a greenhouse during the summer months?

They are best seen when grown suspended in baskets, and when in bloom are very attractive hung from a conservatory roof. The tubers should be put in the baskets after starting them in the brisk heat of a striking pit and gradually inuring them to the temperature of the house, giving them the warmest position during the first few months that the house affords, and keeping them away from draughts and avoiding hanging the baskets too near to ventilators.

They may also be grown in pots; but if it is intended that they shall occupy baskets it is best to plant them in such receptacles at the outset, as often the removal retards their progress for a time. Sandy loam is what they like, and as they love moisture, special attention must be paid to drainage, especially when potting is reverted to. Give them a position near the glass if in pots, and encourage as much as possible, a humid atmosphere in the house.

The ends of the shoots should be pinched out when about 6 in. in height and the laterals tied down to the sides of the baskets, thus presenting, when in bloom, a mass of color. At the close of the season the tubers should be put away in sand out of the reach of frost until the following spring.

✣ St. Vigeans. ✣

The residence of Dr. Stirling, F.R.S., is so named in pious memory of his father, whose schoolboy days were spent in the ancient parish of St. Vigeans, which closely adjoins the town of Arbroath, in Scotland. St. Vigean's Church, indeed, is one of the most ancient in Scotland, parts of it dating from the thirteenth century, and its history is closely interwoven with that of the Abbey of Aberbrothock, which lies within Arbroath itself.

Dr. Stirling has been long and closely identified with the public life of South Australia, but most particularly with the work of the Adelaide University, especially of its Medical School, and with the Adelaide Museum. It would be invidious to single out a special branch of science or a phase of investigation in natural history, and point to it as his strongest work. Like most scientists, no doubt he has leanings to some particular subjects of research, but science, the seeking after truth, is, broadly stated, the work of his life, and much honor and distinction has he won as the result of his labors. It is not within the function of this part of the press to deal with personalities, but to attempt a description of the garden of his home. To leave out consideration of the personality of the man so manifest in his surroundings would be like an attempt to play "Hamlet" without the Prince of Denmark. This is all the more palpable and forcefully impressed upon the visitor, who may have the good fortune to be piloted through the garden by the man himself. The visitor sees nothing in a few minutes, but he may learn much in a few hours. Possibly wearied physically by wanderings in a labyrinth of footways upon the slope of a somewhat steep hillside, his mind receives a fine recreation, and his feelings stirred to great admiration. Such, in brief, was the impression of our representative, who found the doctor a gentleman in hospitality, and, one might say, the moving spirit of the great wealth of his garden, and the encyclopædia there. This may read like flattery, but if absolute facts constitute flattery, then let it pass as such, for what we have not said would fill a book, a book which we hope some day to read. If not, then the world will be that much the poorer.

Now, just where and how to begin a description of Saint Vigeans is no easy task. The house of ample proportions, claiming no pretence to architectural beauties in design, strikes you as a home—a home of rest and quiet.

With the interior we have nothing to do, except in passing through a fine hall the eye is caught by an array of natural history relics of Australia, largely represented by rude, vicious-looking weapons of the aggressive aboriginals, inhabitants who are fast dying out of the calendar of present-day records, and who have a fascination for the doctor in his anxiety to retain what relics are remaining of their history. The visitor is now ushered into his library, the sanctum of his life. This is evidently no place of idleness. Everything here speaks of work, hard toiling work. The very atmosphere seems to be a breath of overcharged mental labor among

"The assembled souls of all the world held wise"

ranged upon shelf after shelf from floor to ceiling all round the room.

There are no books of merely ornamental bookbinders' art here, though, truth to say, the inside of the covers contain pages of bewitching beauty in the printer's art to display the flowers of Nature in their rare and rich colorings and designs. Wealth is here displayed, no doubt, but not represented in so much current coin of the realm, large as that may be. It is the wealth of knowledge and research, stamped with the hallmark of learning. Fain would a thirsty soul for knowledge linger here and read, commune, and talk, but our business is outside with Nature herself, and our host, giving up the time

St. Vigeans, Residence of Dr. Stirling, F.R.S., at Mount Lofty, S.A. Entrance Gate.

that must be very precious to him, leads the way out to the entrance gate to begin with his kind office of guide.

The grounds of the garden are between four and five acres in extent, laid out on the slope of a somewhat steep hill, and the approach is from a district road which runs alongside the property. This road first claims attention because of the fine avenue of Oriental planes, which, the doctor naively remarked, the District Council allowed him to plant. This condescension on the part of the Councillors showed an attribute of wisdom in having an exceedingly pretty country lane added to the original beauty of Mount Lofty, in the district of Stirling West, so named after the father of the owner of Saint Vigeans. The house was one of the first of the many country residences which now beautify the surroundings of Mount Lofty. It overlooks a valley through which the railway runs, the station being within a few minutes' walk from the house. Nearly on the crest of the hill excavations had to be made, and a large area of level ground filled up to take the drive, the house, and the terrace around it. Entering the gate, which opens on to a graceful curving drive, to the residence, the first object commanding attention are the hedges of ivy and Kennedya nigricans and of Pittosporum undulatum. The latter varies from 8 to 12 ft. in thickness, and is about 10 ft. high at the side elevation of the house, which is in reality the front entrance. The end of the hedge is formed into a little arbor, and altogether is one of the finest growth of hedgework that one will meet with. On the opposite side the gate is shaded by a large weeping willow (Salix babylonica). The hedge along the drive is principally of Veronicas, Creme-et-Violet, Imperialis, and Andersoni. A nicely grown specimen of Pittosporum eugeniodes variegatum fills up a space near by a majestic looking Pinus insignis.

Looking over the Veronica hedge, the fruit garden, rising upon the slope, tempts one to linger awhile, but turning away to the other side a yet richer wealth of fruit-tree foliage arrests the gaze, lowering away down the little gully slope. Well sheltered between the fruit-trees are various bush fruits, blackberries, raspberries, gooseberries, and currants. A pleasing variety to this is lent by the lighter tinted green of the horse chestnuts (Æsculus hippocastanum), and two of the finest specimens to be found in the hills of Catalpa syringæfolia, running up to 30 or 40 ft. high. Yet again is the foliage effect broken by growths of bamboos and New Zealand flax. Moving up the drive the curious effect of a strong wind is seen. Close under the lee of the buildings a fine strong tree of Platanus Orientalis (plane) was broken off halfway down, while not as much as a branch was broken from any of the adjacent trees and shrubs clustering around it. It looked like a piece of sheer spite. At this corner the hedge of fence looked almost gay with the red blooms of a Fuchsia corymbiflora. In this corner, too, we find a shadehouse. This is of modestly unassuming proportions, but what it lacks in impressiveness from outward dimensions gains a full equivalent of importance from the affectionate attention bestowed upon it by Miss Stirling, who claims the right of private entree to her special charge. Privilege was granted to the press, and therein we found a nice collection of choice plants artistically set out in rockery and other methods of display. The brown spored fern, originally named from New Holland, Gleichenia flabellata (the New South Wales coral fern), which is fast disappearing from the Mount Lofty Ranges, where it found a natural habitat. Healthy specimens were also there of Scolopendrium vulgare, Adiantum pubescens, Aspidium aculeatum (N.S.W.), Pteris tremula, Asplenium bulbiferum (N.Z.). Tree ferns, Alsophila excelsa and Dicksonia antarctica, were spreading their new fresh young fronds in that graceful, patronising fashion peculiar to their dignity over the modest, yet beautiful and delicate, foliage of Adiantum pubescens. Others that claimed notice were Aspidium elegans, Cyrtonium falcatum, and the hare's foot fern Davallia pyxidata (N.S.W.) The Japanese cycad, Cycas revoluta, and the palm, Rhaphis flabelliformis, also from the land of the rising sun, were growing nicely. A nice, well-grown Dracæna nutans, helped to complete the foliage effects, while the floral beauties were represented by a border of Ericas (Cape Heaths), Salvia dolochoides, Calceolarias, and Camellias, and not forget-

St. Vigeans. View from Terrace, looking west.

ting the piece of Platycerium and the ivy-covered wall. Upon closing the door we were satisfied that this little corner, the only representative of its kind in the garden, was worth a visit.

Moving away now to the front entrance at the side of the house, the circular bed around which the carriages drive, contained a good specimen of a Norfolk Island pine (Araucaria excelsa), some 30 ft. in height. The density of the lower growth of this tree came in for comment as being unusual, and the doctor explained a method of nipping back the tips of the branches, which he had introduced himself, and which had the effect of creating great density of foliage instead of the usual gaunt arms of straggling, dying branches. The thick body of closely growing numberless small branches covered with foliage gave the tree a much more symmetrical figure, with the added beauty of young fresh green shoots.

Attention now being drawn to the floral adornment of the house and adjacent buildings, we note the gable end of the stabling at the rear covered with a mass of ivy, a pretty effect to hide a wall of this character in an unavoidably prominent position. Ivy covering to a wall, however, is considered by many as a doubtful, even if pretty, policy. The columns of the spacious balcony round the house are decorateded with pillar roses—My Pet, Maiden's Blush, Gloire de Dijon, Reine Marie Henriette (red), Banksias (white and yellow), and Reine Olga de Wurtemberg (a good dark vigorous climber). The bordering round the front verandah is set out with Disoma bushes, Sweet Peas, the retiring but pretty pleading Forget-me-Not, and the ever-engaging Lilies of the Valley. To complete the arrangements, a number of pot plants stand at the edge of the verandah and in against the wall of the house. The wall of the western side of the building not reached by the balcony is covered a dense mass of Ampel psis veitchii. Only three plants are required to cover this large area of walling, and being on the sunny side the tints of the autumn fall are a most delightful picture of blended colorings. Some feet away from the house is the bare wall of the excavation, and this we may safely say is the only spot about the place that is not carrying a burden of some sort of beauty. True, it may be found difficult to grow flowers upon bare stones, but there are many climbers that would help to beautify this nakedness.

So far in our description the matter has been all plain sailing and simple enough, but as one approaches the edge of the terrace and from his vantage point overlooks the sloping garden many feet to the valley below, there comes a void of resourcefulness in descriptive power..

Everything—every object—is so uncommon; there is no begining and no ending to it—the multi-colored shades of greens, the variation of foliage, the varying habit of the growth of the trees all massed together in a bewildering confusion, has a picturesqueness of its own, and yet to say that the scene is picturesque would be a violation of all canons of art in landscape gardening. It has no form nor comeliness in it such as the poets of Nature love to describe, and yet every tree of the hundreds there has a rare beauty of its own. No; it must be admitted that the landscape artistic view is lacking until the eye reaches far beyond the limits of the garden to the hill beyond. If this be laid as a fault the extenuation for it is more than ample. The trees that have outgrown the artistic setting of this view of the garden are much too valuable for the woodman's axe, and the artistic effect must always be a secondary consideration. Even from a monetary valuation the specimens there would tally up a sum against which art would have little chance of competing. As the doctor himself said, the vandalism of the art gardener must be left to a successor who has not the same regard for the trees as he has. But after all, what a wealth of beauty is there when singling out the trees apart from their effects upon the scene as a whole. Turn away to

The Western View

from the esplanade shown in the picture, and we will call some of these beauties of the forest by name. Standing in the foreground are fine specimens of Retinospera obtusa aurea, a handsome golden Japanese conifer (6 ft.); Retinospera obtusa nana (4 ft.), dense and compact; and the New South Wales Waratah (Telopea speciosissima); and a few shrubs giving a dense green setting to the floral burden of Rhododendron blooms, rich, profuse, and gay. Sloping up the hill the prevailing foliage is of the conifers, and such a lovely variety of form. That fine tree catching the eye at first glance at a height of 20 ft. is a Cryptomeria elegans gracilis. This charming Japanese conifer of dense growth and great beauty, now a rich green, will change its hue to a lovely bronze in the autumn. These ever-changing colorings are the added charms to the always graceful growth of the conifers. There is another, some 40 ft. high, Cupressus torulosa, a fine pyramidal tree, with numerous short, slender, horizontal or deflected branches to near the ground and drooping branchlets. This native of the Himalayas is perhaps the handsomest of all the cypresses. Look at that Golden Lambert (Cupressus horizontalis aurea), another 40 ft. of loveliness, with its tall, handsome spreading growth. Its lovely golden tints grouped with the deep rich bronze of Prunus Pissardi and the neighboring setting of green gives an engaging little picture of coloring. Now, if the eye requires a little rest from these stately geometrical forms of beauty from the mountains of far away, just turn aside a little to the tropical aspect hard by, and find relief in the waving Cordylines, and note the Club Palm, or cabbage tree, from New Zealand, with its tall growing palm-like foliage. And the Cedrus Deodora, which carries the mind away again from the vegetation of the south to the histories of long ago, when the Arab, in his regard for its majestic appearance, named it Kedree, meaning power in our language. This particular species of the family, however, hails from India. Wherever this specimen came from he does the country of his adoption credit, with his 35 ft. of spreading growth and height. Near by is another specimen of the Prunus Pissardi (crimson-leaved prune), and the variation of colors in this tree is worth remarking. When first put forth the tender foliage is of a pinkish purple, changing the royal color to a hue of red, and finally shading off to a deep dark purple, retaining this unusual tint of leaves till late in the autumn, unaffected by the sun. It is not generally known that the fruit of this tree makes a delicious jelly or jam. There, too, is one of the charming family of Myrtles, about which so little seems to be known, and more is the pity. This is a tall specimen of the New South Wales Eugenia myrtifolia, a handsome grower, and for its neighbor the Queensland Bunya Bunya (Auracaria Bidwilli), well furnished up to 40 ft. high.

The striking feature of this view is that 40 ft. of silver fir tree (Abies Nordmanniana), one of the spruces. It is one of the handsomest of the silver firs, and certainly the hardiest. Its conical shape is finely symmetrical. The underside of the foliage is of a rich silvery color and the upper side a deep green, while the young shoots are quite smooth, glossy, and of a light green tint. There is another of the cedars, the Virginian (Juniperus Virginiana), a very showy glaucous colored conifer, dense and compact. Then, to vary the foliage again, is a New Zealand laurel (Corynocarpus laevigata), a beautiful evergreen leaf of laurel shape. A Romneya Coulteri is noted, and the splendid long light green broad leaves spreading out are recognised as the Doryanthes excelsa (Queensland Lily). We have lingered as long as time will permit over this view, but in turning away the eye does not escape a specimen of Pittosporum eugenioides variegatum, which is one of the showiest of all the variegated foliage trees and shrubs. Its effect when planted for contrast of color with other evergreens is very pleasing, and it never burns during the heat of summer.

Some critics may now wonder why we are specialising so many details in this garden. The explanation comes readily enough in the fact that the garden is a liberal education to any one interested in ornamental trees that are rarely seen in private gardens, and never better grown. On this account we offer no apology to the readers of "The Australian Gardener," and are pleased to state that the remainder of this article has yet an abundance of rare beauty to describe. In fact, there is nothing common or unworthy of note in the whole place. Our only regret is that space forbids a more complete description.

(To be continued.)

ROSES.

A Chapter on Roses.

At the request of several of our subscribers, and being persuaded that such a return would be interesting to a large number of our readers, we communicated with the best growers and the most successful exhibitors of the rose throughout the colony, requesting the names of the best twenty-four hybrid perpetuals and hybrid "teas," and also of eighteen "teas" which they considered the most suitable for exhibition purposes.

Not only have our chief growers in the metropolitan district taken the trouble to furnish the lists as asked for, but the more distant growers, residing in Ballarat, Bendigo, Harcourt, Hamilton, Riddell's Creek, Rosedale, and other places, have kindly given their experience.

For the best twenty-four H.P.'s and H.T.'s 105 names of different varieties were received from thirteen growers, but from this number eighty-one kinds received only one, two, and three votes each. For the first twelve great unanimity exists, but for the second twelve there is a great falling off in the number of votes recorded. The following is the voting: Mrs. John Lang and Earl of Dufferin, 11 votes each; Captain Christy and La France, 10 each; A. K. Williams, Charles Lefebvre, and Prince Camille de Rohan, 9 each; Alfred Colomb, Her Majesty, and Ulrich Brunner Fils, 8 each; Marie Baumann, Madame le Baronne de Rothschild, Madame Gabriel Luizet, Caroline Testout, and Duke of Edinburgh, 7 each; Fisher Holmes and E. Y. Teas, 6 each; Gustave Piganeau, 5 votes; Merveille de Lyon, Queen of Queens, Lady Mary Fitzwilliam, General Jacqueminot, Rev. J. B. M. Camm, and Margaret Dickson, 4 votes each.

For the best eighteen "Teas" seventy-five names were submitted. We give the names of twenty, being those which received 4 votes and upwards: Catherine Mermet, 13 votes; The Bride, 12; Souvenir d'Elise Varden and Marie Van Houtte, 11 each; Perle des Jardins, Contesse Nadallas and Niphetos, 10 each; Madame Lambard, Marechal Niel, and Grace Darling, 9 each; Ernest Metz and Sunset, 8 each; Devoniensis, Francisca Kruger, Hon. Edith Gifford, and Madame de Watteville, 6 each; Jean Pernet, Kaiserin Augusta Victoria, Rev. T. C. Cole, and Lord Tarquin, 4 votes each.

These selections compare well with the census made at the last show held by the National Rose Society at the Crystal Palace.

Although such lists must be excellent guides to rosegrowers, they must not be taken as containing absolutely the very best varieties in cultivation, but they may be considered to comprise the best of the older and more generally cultivated sorts.

Even in England, where there is always a good demand for novelties in roses, the older and better known kinds far outweigh in value the more new kinds, yet there are some new ones which, when better known, will take rank with the finest of the older ones.

For instance, in the tea section Maman Cochet, Madame Hoste, and Innocente Pirola only received 3 votes each, yet they are of equal merit in the opinion of many with the best of those named in the twenty. Then, again, Kaiserin Augusta Victoria, a rose of most beautiful shape, carrying its creamy white flowers well up on strong shoots, only received 4 votes. Ernest Metz, when better known, will probably be as great a favorite as any. It is reliable, and scarcely any rose can surpass it for form and substance, is of robust habit, and its rosy pink flowers of tender shades are produced on strong, erect stalks. This variety is most distinct.

In the section embracing hybrid perpetuals and hybrid teas, Mrs. John Lang and Earl of Dufferin are given of equal value. The former was far and away ahead of all others in the English census, its perfect shape, its size and fragrance, almost perpetual blooming, freedom of growth, and possessing almost an immunity from mildew, stamp it as one of the finest roses extant.

One of the darkest roses known is Xavier Olibo, but this is not placed in our twenty-four, and yet in England it is much appreciated, and received the silver medal at the Derby show last summer. Old General Jacqueminot cannot be beaten for general usefulness; when in good form it is excellent for show purposes, although, through its fewness of petals, it is apt to open quickly; it is a grand rose for hot dry weather.

Mr. G. S. Titheradge, who is known to be as good an authority upon roses as he is upon daffodils, in his letter accompanying his list of roses, says that the finest individual rose blooms he ever saw were Earl of Dufferin and Margaret Dickson (hybrid perpetuals) and Mrs. Paul (a Bourbon), a beautiful camellia-like flower, blush white, shaded with peach, and thick bold petals.

This gentleman's experience of rose-growing is similar to that of most of our professional growers, and it is that some of our best exhibition varieties are very variable, depending on a number of conditions, soil, position, season, and so on, and that they are not so satisfactory on the whole as many other kinds; yet a few are equally well adapted for both show and ordinary decorative purposes. In classifying the roses here given, we have followed the English system of including the hybrid teas among the hybrid perpetuals, but it is found in England difficult to say which section a few varieties belong to. Both there and here the hybrid teas are very popular; they are nearly all good, many have the brilliancy of hybrid perpetuals, are thoroughly hardy, and possess the delicious fragrance of the true "Teas."

As a rule the hybrid perpetuals are more decided and generally more brilliant in color than any other class; they are also larger and more attractive; but the name perpetual would be better adapted to the "Teas," which remain much longer in flower than the others, and by judicious management, pruning the plants at different times, they may be had in flower a good portion of the year. Our frosts are not sufficiently severe to hurt them, but in England and many parts of America very many of the "Teas" are tender and have to be protected in the winter; yet despite the little extra attention they require, their delightful and refreshing fragrance, combined with their lovely tints and exquisite delicacy of coloring, make them extremely popular.

As a class the "Teas" are the earliest to begin flowering and the last to leave off; they are also the freest bloomers of all. They are the best for bouquets, for vases, and for buttonholes, and when cut last much longer than the hybrid perpetuals. Another advantage they possess is that the plants remove well, even quite old specimens may be transplanted with good results. It is also stated that "Tea" roses succeed better in poor soils than hybrid perpetuals do.—"Australasian."

* * *

Rose for the Rock Garden.

Rose Gustave Regis Under Glass.

What a glorious Rose this is at all times and in all forms and positions. This year I have it growing in a pot in a cold house trained on a pillar. The elegant buds under these conditions become beautifully elongated. I lately measured one which was a trifle over 2 inches in length, although not more than 1¼ inches in diameter at the base, so that one may readily judge of its beauty. The canary yellow seems much heightened when grown cool. Gustave Regis would be a grand variety to plant out under glass. For this purpose I would prefer one in standard form, for it makes a grand head in a year or two. Such a tree could either be planted in the centre of a bed—if so, plenty of space would be needful—or the growths might be trained upon the roof. It would also be a very suitable kind to run up the pillars of the house. When the expanded flowers of this Rose can be partially shaded they remain on the plant quite a long time although almost single. It would be difficult to say which to admire most, the charming long buds or the immense shell-like petals of the developed flowers, which are often as much as 6 inches in diameter.—"The Garden."

How to Prune Roses.

IT ALL DEPENDS ON THE CLASS THEY BELONG TO.

J. Meehan, in "Country Gentleman."

The proper way to prune a rose depends altogether on what class it belongs to. What old-fashioned people call daily roses, which are those that flower all through the season, and embrace tea, China, Bourbon, and noisette and their hybrids, require close pruning. The flowers are produced from shoots made the same season, and the closer they are pruned the stronger are the new shoots and the finer the flowers. But it is not advisable to cut them down too close to the ground, as this results in but a few strong shoots and large flowers. Not quite so close cutting gives more shoots and flowers, and even if the flowers are not quite so fine as they are under the other system the display is greater. With the knowledge that this class of rose is better for being cut back pretty well in spring, there is not the necessity for covering the tops completely in winter, and very often a few spadefuls of soil heaped about them in early winter will be found sufficient.

There are few other sorts requiring cutting back so much as the ever-bloomers do, so that after determining whether a certain rose belongs to that section or not, the proper way to prune can soon be decided on.

The next most important class consists of what are called hybrid perpetuals, or June roses. The name of June roses comes to them because they bloom freely in that month, and then are done for the season, save a few stray flowers at intervals throughout the summer. The old name, "hybrid perpetual," is a misnomer. Their mode of flowering is like that of nearly all flowering shrubs. The blossoms come mainly from shoots of the previous season's growth. Hence these last year's shoots must be carefully looked after, as if cut away the crop of flowers goes with the cut-off tops.

The way to prune them is to cut back the shoots partly, leaving about two-thirds of their length. This lessens the number of flowers a little, but adds to the strength and size of those that do come. If cut down as low as recommended for ever-bloomers there will be no flowers.

Climbing roses require much the same pruning as June ones. There must be some length of shoots made the previous year to have flowers. Unless with good care these roses will make new shoots too much at the top and not enough at the bottom, when trained to arbors and posts, very much as grape vines are apt to do. In this case they need cutting back closely to get new shoots nearer the ground, but when this is done there will be but few flowers that season. The skill of the gardener has to be exercised to keep a supply of young shoots when the flowers are wanted. Sometimes by cutting weak shoots back closely in spring and leaving the strong ones for flowering the object can be accomplished.

Roses for the Rock Garden.

Rose Charlotte Guillemot.

Whatever may be the defects of this Rose outdoors—and I admit it is rather a poor grower, although generally described as vigorous—the delicacy and refinement of its creamy white blossoms under glass make amends for its somewhat indifferent growth. It seems to me that many of the glorious Hybrid Teas that cannot boast of a vigourous constitution will become our best indoor Roses, for they have an upright habit all in their favour, and they also in most cases have fulness, a quality many of the Tea-scented group are deficient of. Mme. Cadeau Ramey, Antonie Rivoire, Souvenir de Mme. Eugene Verdier, and Souvenir du President Carnot are really magnificent when grown cool under glass. It is strange, but I think only too true, that some of the recent Hybrid Teas soon succumb to the rigours of a severe winter. If hybridising with Teas tends to produce a race deficient in hardiness (and here is a subject of discussion at the Chiswick conference), why do not our raisers introduce some Bourbon blood into the Hydrid Perpetual race, or even cross the atter with distinct varieties of their own tribe, especially those that bloom freely in autumn? Possibly no rosarian has ever met with a ripe seed pod upon Francois Michelon outdoors, and yet we are told that from this variety Mr. Bennett secured his masterpiece Mrs. John Laing. Therefore, it would seem desirable in order to obtain good novelties to induce those Hybrid Perpetuals, whose good points one would like to see embodied in novelties of other colours and form, to seed under glass. P.

Rose Ulrich Brunner.

Anyone requiring one of the handsomest Roses for massing should not fail to plant this good, hardy, free and vigorous sort. Not over tall in growth, the short, thickly set branches reach to about 2 feet high in the first year, and give a really splendid display of the richly-coloured flowers. For profuse flowering, perhaps there are many that could easily surpass this, but these not infrequently are smaller, and do not therefore create the effect in the garden that is often needed and so seldom gained. A bed filled with Ulrich Brunner cannot be overlooked. Large and broad in petal, it is one of those kinds that open quite freely even in such harsh, dry, hot summers as that of 1898. A good companion plant, in so far as freedom and height are concerned, is Captain Christy, one of the best light-coloured sorts for the same purpose. Both are free and good, and, indeed, may be used in conjunction with each other if necessary, the former in the centre, the lighter sort being placed around for a margin.—E.J. "The Garden."

Rosery and Pergola.

By David Cole.

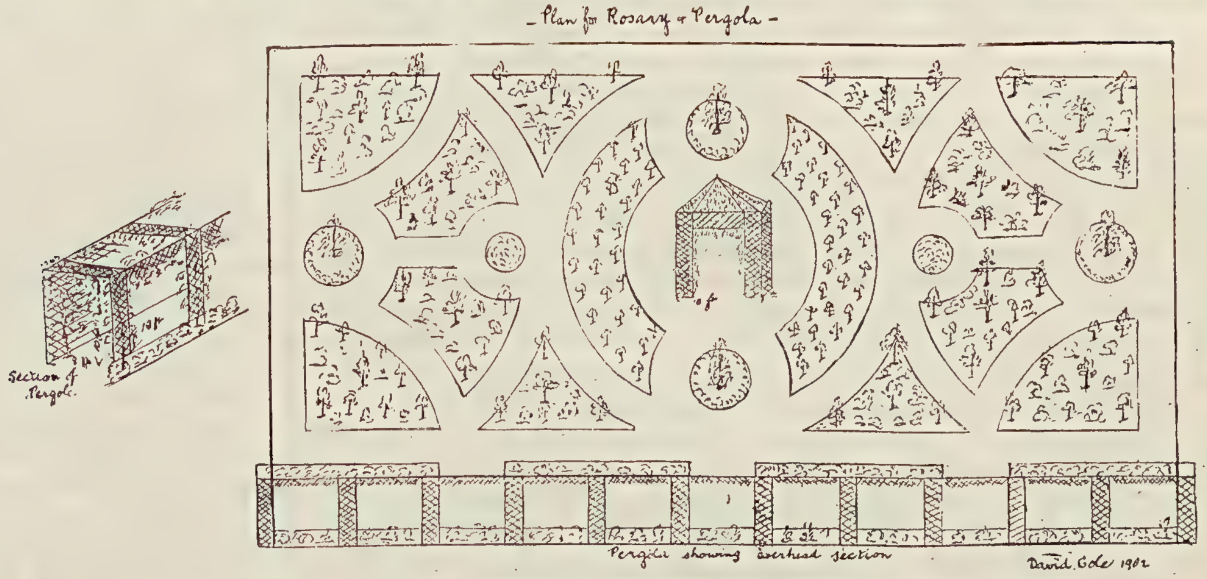
No garden in England is considered complete without a pergola, and rightly so, for what is more delightful than a walk shaded with festoons of Roses, Wistaria, Tacsonias, Clematis, and other beautiful climbers trained to the uprights and cross beams. The wonder is that in Australia particularly they were not introduced years ago. In England they the generally constructed with rustic poles. The ideal place for a pergola is in conjunction with a rosary, as shown in the sketch. The structure in the sketch is my own idea, built for the dual purpose of beautifying the garden and to make a breakwind by leaving one side all latticed. The laths are crossed 4 inches apart, which gives room to put the hand through when tying up the climbers. It also serves the essential purpose of allowing the wind to filter through, which for many reasons is better than having the laths nailed closer together. If the position of the garden does not require a breakwind another idea is to have the pergola constructed through the centre of the rosary each way to form a cross. The sketch given, however, is simple, and designed to show what is required in making a rosary.

In the first place, care should be taken to adapt the design of a rosary to suit the particular piece of ground and surroundings. It must be simply a scroll or geometrical to suit the convenience of the gardener in moving the hose about, and in using the lawn mower. A principal feature of the design should be to make the rosary appear as large as possible, with ever-changing views to show off the beauties and peculiarities of each class of rose, such as the Banksias on the pergola for breakwind, and for the front Cloth of Gold, Devoniensis, Gloire de Dijon, and climbing Souvenir de la Malmaison. The pillar roses in the larger beds should be trained to rustic posts with wire netting for tying. Then the beds for Moss roses should be well in view. Here I may mention that Moss roses should always be pegged down. The bush is of a dwarf habit growing on its own roots. Peg the growths down to the ground with strong pegs, and each eye will break and throw up a flower. By bending them over they will throw up shoots from the base, which are to be pegged down next year, and the old shoots or growths cut away. This is the only method to make them a success. Equally careful must be the management of the other roses as to habit of growth, color, &c. The various classes should be kept separate if possible.

The sketch shows four large round beds for pillar roses trained to be rustic posts 10 ft. high, or on tripods—posts for preference. The edging of the plots is of Fairies. The two smaller round beds are for the pegged down common Moss rose.

Prominent corners and centres of beds, where large plants are marked on the plan, are for strong-growing standard roses trained to strong rustic posts 6 or 7 ft. high and dwarf roses planted in between.

January is one of the best months for preparing the ground for a rosary. To make it permanent and a thing of beauty for many years it must be trenched 2 or 3 ft. deep. The bottom of the trench must be picked up and manure in plenty thrown in with bonedust well worked and mixed with the soil as the operation proceeds. Care must be taken to keep the manure below the first foot of surface soil, otherwise it will be in the way of levelling. Manure can always be worked in the surface soil afterwards. Different soils require some judgment in the matter of trenching.


– Plan for Rosary & Pergola –
Section of Pergola.
Pergola showing overhead section
David Cole 1902

Plan of Rosery and Pergola. Pergola showing Overhead Section at Bottom of Plan.

If the subsoil is of a rubble limestone I would decide to have gravel walks. Rob the walks of the good soil on the top, and run it with a barrow on to the beds. Then put the limestone rubble out of the trenches on to the walks. The gravel walks should be so arranged that you can stand the sprinkler on them, throwing the water clear, and enabling you to walk about them immediately afterwards without being wet under foot. To make the gravel walks set properly, the large stones should be raked in to the bottom as the work proceeds, leaving about a foot of gravel on top, and the water will drain away as fast as it comes. Level the surface to its proper height with boneing rods and line, and then mark out the plots. If the ground is not properly prepared and drenched the roses will last only a few years.

If the soil is all deep I would advise planting buffalo grass for the walks. The grass can be always kept neat, and the bright green makes a nice contrast to the beds of roses.

Jonquils and other bulbs go well with roses, as they can remain in the ground. Carnations and Pansies also do well with the roses, and make a good variety of coloring, both in foliage and flowers.

If rustic posts are used for the pillars and pergola uprights, I must let you into a little secret of which few gardeners know the value. When putting the posts into the ground always place them in the reverse way to which they grew; that is, upside down. If possible, cut them to have a fork in the ground. This will strengthen them to a good firmness, and they will not rot. The theory regarding this little secret is that during the growth of the timber the sap rises in a particular way through the structure of the wood, and water will rise in the same way to the surface of the ground when the wood is put in the ground and cause rotting. But if the wood is reversed when putting the posts in the ground the water will not rise, and this prevents the rotting.

If rustic uprights are not used, then take 4 x 4 in. jarrah timber. Put the posts up in pairs 2 ft. apart, leaving a space of 10 ft. between each pair of posts. Make it 9 or 10 ft. high above the ground. Crossbeams 3 x 2 and 10 ft. long will give a spacious footpath. Pig netting of 4 in. mesh should be stapled up the pairs of posts and over the top. The wall plate should be 4 x 3 timber, and the pig netting 2 ft. deep hanging along the front. As before mentioned, lattice work of 4 in. mesh should be nailed on to the windward side, and no more effective breakwind is possible. This is far better than a solid wall of wood or iron, for if the structure be made solid a strong wind will curl over the top, and is capable of a good deal of damage. But if the wind is allowed to filter through lattice work as described it will do no damage. On the contrary, no matter how strong the wind may be, the lattice has the effect of breaking it into a gentle breeze.

After many years of experience in England, and having introduced pergolas combined with rosaries into Australian gardens, I can confidently recommend these suggestions as peculiarly suitable to this climate, and am quite satisfied that no other part of a garden can be made more beautiful and attractive especially in the heat of summer.

TROPÆOLUM SPECIOSUM.

Who that has observed this beautiful, hardy, flame-flowered Nasturtium in flower in Scotland and the North, has not envied their northern gardener, the almost exclusive possession of his floral treasure? It is remarkable that this pretty and erratic plant, although a native of sunny Chili, should flower and grow but poorly as a general rule in the sunnier parts of Britain, and succeed so well in the misty North. Here and there one hears of success attending its cultivation in the South, but those cases are very exceptional. One such I came across a few weeks ago; the plants were growing in comparative luxuriance. This was at East Burnham Park (near Burnham Beeches), as warm and sunny a district as anywhere within the same distance of London. The plants were not in their full beauty when I saw them, but, judging by the number of open blooms and those which were in bud, they would make a brilliant and beautiful show till the beginning of the present month. The tubers were planted some seven or eight years ago in a border facing north, among some Rhododendrons and other shrubs. The growth they made during the first few years was feeble and disappointing, and many persons would have despaired of success; but Mr. Vitch had set his heart on establishing this plant in the garden of his then new country house, and that he has succeeded so well is due, perhaps, more to the fact that he chose a suitable position for it, and, having done that, he let it alone; and the growths now cover most of the shrubs, and promise to take possession of the lower part of the roof of the house. [This plant grows freely in Australia.—Ed.]

"The Gardener's Chronicle."

Orchard Notes.

January is an exceedingly busy month with the fruitgrower. He is in most cases realising the biggest results of his year's labors. It is a month replete with duties, opportunities, and possibilities. The soil must have increased attention in the matter of hoeing and cultivating, as it is much trodden down during the harvesting of the fruit, and the general tendency is to allow it to become dirty and neglected. On large areas the disc around should be kept going, especially after the heavy tropical showers that frequently characterise the month. Peaches and apricots will now be yielding crops. Peaches must be ripe but firm before gathering. Apricots if full sized and well colored will ripen after leaving the tree. Both should be handled as little as possible. The canning and sun-drying of these fruits is a profitable way of disposing of them, and tends considerably to ease the market when threatened with a glut. Fruit should be firm, fleshy, and sweet for this purpose. The art of preserving prunes, the drying of peaches and apricots, to say nothing of raisins, currants, and figs, is still in its infancy in this country, notwithstanding climates admirably suited exist in the northern portions of New South Wales, and Victoria and in South Australia generally. Until this industry is thoroughly developed growers will continue at the mercy of a fluctuating market. There are many instructive publications for those who would be informed on the subject.

Stone fruit intended for the fresh fruit market demand a pretty prompt disposal, as they do not stone well. They should be very carefully graded. Honesty is undoubtedly the best policy, and uniformity of size and quality maintained. The lower grades will not thus detract from the value of the high quality fruit, but can be packed separately and offered at a lower rate. Jam factories usually absorb a good deal of the inferior fruit. It may occur to the progressive grower at this season that with improved cultural methods all his fruit might be of the first grade. All stone fruits for transit must be carefully packed in boxes lined with soft paper and relieved of all possible pressure. For canning only fruit of the best quality must be used. The Moor Park apricot can scarcely be improved upon. These come in towards the end of January, as also do the Williams' Bon Chretian pears, excellent for this purpose. One of the best canning peaches is the Lady Palmerston, which will not be ready until March. Those who grow fruit for commercial purposes cannot be too particular as to the details connected with the appearance of the fruit they offer; appearance counts for so much. The pity is that the large quantity of inferior fruit is out of all proportion to the quantity of really first class fruits on offer, and all because there is a want of thoroughness in the cultural methods. People attempt more than they can conscientiously accomplish. Liberal supplies of water given at this period will help to swell the fruit of apples and pears. The destructive gales experienced in November will have thinned the fruit very considerably, and in some cases the spurs, too, but where this has not been done ruthlessly by the wind the trees may be relieved of some of the crops, especially the small unpromising fruit, which are very often the result of imperfect fertilization, and all that seem to be in excess and are interfering with the development of those required.

Summer pruning to obtain light wood of a fruiting character may now be done. Apples, pears, apricots, and plums may have the shoots not required for extension pinched or broken beyond the fourth or fifth bud. This should lead to the development of weak side shoots which will eventually become fruiting spurs. Thin out crowding shoots and spurs and the leading wood to admit light and air to ensure the proper development and ripening of the fruiting wood, and to keep the trees clean and free from insect pests and disease. Peaches do not require more than a little thinning of their laterals and leading shoots. Gooseberries, red and white currants should be thinned, and have their side growths shortened. Black currants only require the old and crowding branches removed. They are not summer pruned. Remove weak and superfluous canes from raspberries, and take care not to injure the young canes when gathering the fruit, as they will be required to furnish future crops. Cultivate all these bush fruits, and encourage them to make a free growth during the summer. Thin out strawberry runners, select the best for layering and have beds or borders deeply trenched for their reception. Keep all strawberry plants well watered and give liquid manure to those that have recently borne. Continue to treat citrus as advised in the last issue. The budding of peach, apricot, cherry, and citrus trees can be proceeded with, although in earlier districts it can be delayed with advantage until February.

Bandage traps for codlin moth can still be placed on apple trees, while those on the trees should be examined from time to time to destroy the insects concealed in them. Continue to remove all superfluous growth, and see to the fastenings of trellised vines. In anticipation of a heavy crop, the supports should be of sufficient strength. Do not allow more than two or three bunches on a branch to remain, and nip the shoots a joint or so beyond the fruit. Allow the grapes a free current of air and light and warmth without unduly exposing them to the fierce heat. Allow them to be slightly screened by their own leaves without a heavy mass of foliage choking them. If the season should turn cold and wet thin the foliage severely, so that the fruit may benefit by all the warmth available. Keep the soil round vines clean and well weeded. Prune and cultivate to maintain a steady, even temperature. A warm, moist atmosphere and warmth and moisture and sweetness in the soil are ideal conditions for the vine.

Vegetable Garden

OPERATIONS.

The present month is exceedingly trying both to the vegetable and its grower. The principal operation is watering, continual and regular watering to sustain a free, quick growth in the plants, and not to allow them to flag or droop for a single moment. The advantage of well enriched, well mulched beds will be very obvious, considerably lightening the labor of cultivation and materially affecting the results. Weeds must be kept in check, all exhausted crops and remains of plants should be removed to the rubbish heap, and beds lately occupied kept lightly hoed or the soil renewed and well enriched ready for another planting. Seeds of vegetables for autumn planting can now be sown, among these cabbages (early and late varieties), celery, turnips, carrots, French beans, salads, and cauliflowers, spinach, and silver beet may also be sown for autumn use. Continue to sow radishes where they will be afforded shade and abundant moisture. Celery trenches must have copious supplies of water and liquid manure. Additional trenches can be prepared either for a fresh sowing or the reception of young plants. The seedlings from recent sowings should be carefully thinned to allow each little plant ample room to develop itself. Carrots, turnips, parsnips, and lettuce should all be thus dealt with. Water before thinning, and again after, to prevent disturbance of the roots. Onions can still be pulled when they are dry, and stored in a cool, airy shed.

Give plenty of water and liquid manure to melons while the fruit is growing and swelling, but lessen the supplies as they begin to show signs of ripening. Melons require to be artificially fertilised when in flower. Cucumbers, marrows, and pumpkins want even more abundant supplies of water. All this family is benefited by having their growth regulated, stopped, and thinned. Pinch the fruit-bearing shoots a joint or so beyond the fruit, and in the case of a heavy crop of melons thin out the fruit. Cut marrows and cucumbers when they have attained about half their normal size. The flavor is incomparably superior at this stage.

Keep the soil moist round tomatoes, never allowing it to entirely dry out. See that the plants are firmly secured to the supports, and pinch out the laterals as they appear. When they blossom is the time to increase the crop by artificial fertilization. Many growers do this by shaking the supports in the middle of the day, thus causing a distribution of the pollen, but a surer method is to brush the anthers lightly, so that it is wafted about by the breeze. Do not neglect asparagus beds at this period; it is important to keep up the supplies of water and liquid manure.

* * *

BUSH FRUITS.

The past generation has seen a remarkable spread of the interest in the cultivation of the raspberries, blackberries, dewberries, currants, and gooseberries, says "Country Life" in America. Not so very long ago they were considered to be quite unworthy the serious attention of the cultivator, and this feeling still lingers among the farmers. From mere garden accessories, however, the small fruits have come to be commercial crops and the main reliance of many fruit growers.

They all yield quickly to good care. The shallow roots depend largely on the good tilth and richness supplied to the surface of the soil. Bearing in summer, the excellence of the fruits depends very largely on the supply of moisture in the soil, which is stored and saved by good tillage. Without this raspberries and blackberries may be so hard and juiceless as to be hardly worth the harvesting.

Cultivation is the first requisite to success in bush fruit growing.

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WRINKLE WITH TOMATO PLANTS.

An Iowa Homestead correspondent sketches his plan of setting out tomato plants:—I let the plant get a good size; and then I set it deeply in the ground and cover the stem on an incline, usually leaning to the north. A reservoir is left for watering the plant. Give one quart of water to each plant when set, another the next evening, and the next morning fill the hole full of dirt. Every joint on the stalk will put out roots, and heat and moisture will start nearest the suface first. The plant will withstand whatever season may come. If the season is wet, the upper roots will push the plant along; if dry, the lower stratum will not let growth check.

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Hand-Feeding Stock.

By T. R. SCOTT, Inspector of Stock, Moree.

Mr. Guthrie's pamphlet on hand-feeding stock has been received with a good deal of interest in districts where hand-feeding has been largely resorted to during the present drought.

The following notes, made from personal observation during my tours in the district, may prove of interest. I have distinguished the various places by numbers, to avoid giving too much publicity, as some owners do not wish their names mentioned, for various reasons.

No. 1 Station.—10,000 ewes and lambs were fed on an allowance of 1¼ lucerne hay per head per day for between two and three months. This gave good results, and about 15 per cent. lambs were saved. On same station 10,000 weaners were fed on barley straw and molasses, the latter at a strength of 1 to 14. The method adopted was to soak the bales with the molasses overnight, spreading out the straw next day. The results were not satisfactory; the sheep lost condition, and were beginning to die. The feed was then changed to 1¼ lb. good wheaten and oaten chaff, with plenty of grain in it, and they have been about four months on this ration, with occasionally a little lucerne hay or mangels for a change; when this was given the allowance of chaff was reduced proportionately. The sheep improved soon after the change from molasses and barley straw to chaff was made, and have since done fairly well, with very little loss.

Had there been sufficient scrub on this property, hand-feeding would not have been resorted to.

The manager considers lucerne hay the most satisfactory feed, but, owing to the high prices and scarcity, it has simply been a matter of using whatever feed was procurable.

On No. 2 station 6,000 ewes were fed on a ration of ½ lb. wheat per day, given night and morning in equal feeds of ¼ lb. per head. At time of visit the sheep had been fed for three months with satisfactory results. The wheat was soaked for twenty-four hours, and given in galvanised iron troughing. The ordinary half-round guttering was used. The sheep had no other feed, but were looking well and evidently doing well on their allowance. No loss to speak of was experienced after feeding was resorted to.

On No. 3 station 12,000 sheep were being fed on scrub and maize, ¼ lb. maize per day being the allowance; the results were satisfactory.

Another lot of 2,000 breeding ewes were being fed on ½ lb. oaten hay and 3 oz. maize per head. The method adopted was to scatter the corn broadcast on the ground over 3 or 4 acres, keeping the sheep back until the feed was all spread. The sheep were then allowed to come quietly on to it, and by this means all got an equal share. Of this lot of 2,000 ewes, previous to being fed, 100 were lost in a week. After being fed for a week, the loss was one only, thus showing the value of the feeding.

On No. 4 property the stud sheep had been fed for several months on an allowance of ½ lb. of maize spread broadcast, varied with a little lettuce hay and mangels when procurable; these sheep were pulled through without loss, and a good many of the lambs saved.

RE PRICKLY PEAR FEEDING.

I have lately visited a number of holdings in the district where prickly pear feeding for cattle was resorted to.

On No. 1 400 head of cattle had been fed on prickly pear for four months with a loss of 1 per cent. per week. The owner was satisfied with the results, as the cattle were very poor when he began to feed. He estimated the cost of feeding at 6d. to 7d. per head per week. Seven (7) men were employed in preparing the feed. The method adopted was boiling and steaming to destroy the thorns, and, after cooking, cutting the pear up into moderate-sized pieces. I consider the method of steaming the pear much the best, as it is drier and easier to handle, and no slop as when boiled. An ordinary 400 gallon tank with the head cut out was used. The portion cut out was punched with holes and let down into the tank, on blocks about a foot from bottom. The water was then put in, and under the false bottom, and the tank filled with pear and covered over. In about an hour it was fit for use; that is, the thorns were destroyed.

(To be Continued.)

* * *

Hand-Feeding Sheep.

In a communication to the Hon. the Minister for Mines and Agriculture (forwarded through Mr. J. B. Reymond, M.L.A.), Mr. N. A. Gatenby, of Forbes, states: "At the Forbes Show concert I made the statement that for some months, until the river failed, I had fed 15,000 sheep off 200 acres of irrigated lucerne.

"The plan adopted was this: Some 6 or 7 acres of lucerne was mowed each day, and carted out to the sheep, which were in lots of about 1,000 each. Within a day or so of cutting the lucerne was watered, and by the time the 200 acres was cut, the first patch mowed was ready to cut again. Had the river not failed, I could have continued this practice right through the summer.

"I may mention that in 1898—another year of extreme drought—the river did not fail, and I irrigated from September to May. I cut the lucerne twice for ensilage, twice for hay, and three times for feeding sheep in the manner above described. The cuttings could have been continued, but rain fell, and I stopped cutting for the season in May. In the winter the lucerne will not grow much.

"In that year I fed 8,000 sheep during February, March, and April, off 120 acres cut as above. I had also 2,000 sheep grazing on other irrigated paddocks that I did not cut.

"No one knows the value of irrigation in our district better than Mr. Reymond, and I am sure that both he and I look forward to the time when great head works will be commenced with a view to giving us a more certain water supply."—"Agricultural Gazette," N.S.W.

✣ REVIEWS. ✣

KERNER'S "NATURAL HISTORY OF PLANTS," WITH BOTANICAL NOTES BY "S."

Contrary to general belief, pollination does not seem to be essential to reproduction. "In northern latitudes Gnaphalium alpinum is exceedingly common, but neither in Arctic America or Arctic Asia has a plant producing pollen ever been found."

Kerner conducted some experiments with the utmost care with the Annual Mercury, and obtained fertile seed and young plants when no pollination could have taken place.

An Australian plant, Coelologyne ilicifolia, introduced into Europe in 1829, continues to bear fertile seeds and new plants, although no male flowers have ever been detected.

The explanation offered is that these seeds grow, not as seeds, but as a mere part of the original plant. If part of a root, of a stem, of a leaf, will grow, why not a seed, quite apart from fertilization?

Many curious abnormal growths are found on trees and shrubs, known popularly as galls. These are produced sometimes by parasitic fungi, sometimes by insects. One of these fungus galls is found on the leaves of the Rhododendron, and grows to the size of a small apple. It is rosy-cheeked like an apple, and has succulent tissue and a sweet taste, and is even covered with a bloom. Other galls are tubercular, with horns; others, from their branched appearance, are called "Witches' Brooms;" others are too well known to us, as the "curl" on peach trees.

Of insect galls there are felt galls, mantle galls, solid galls, scroll galls, pocket galls, covering galls, purse galls, &c., named from their various shapes.

The gall produced by Cecidoses eremita on the young twigs of Duvana longifolia is thus described:

"The gall is quite spherical and very hard, and its large cavity conceals the caterpillar which has been hatched from the egg. When the time draws near for the formation of the pupa, a plug with a projecting rim is developed on the side of the gall furthest from its point of attachment. When the plug is pushed out a circular hole is left which leads into the gall chamber, through which the caterpillar escapes from its dwelling." One would like to know how this neatly shaped plug is "developed;" the author does not suggest.

Production of New Forms as a Result of Crossing.—Gardeners, we know, are ever experimenting with a view to raise new varieties, but it is startling to learn that of Roses alone there are 6,400 kinds. Propagation of varieties may be by cuttings, layers, buds, or grafts, "but the first origin of new forms is always to be traced to crossing."

Natural hybrids are considered to have been produced in the same way, and these being established a new "species" is the result.

Sub-divisions of the Vegetable Kingdom.—Some 200 pages are taken up with an account of the families into which plants are divided under the natural system The customary divisions are followed, and to show their points of general resemblance they are divided into "alliances."

Dispersal of Plants.—This is effected in various ways, and by different agencies: by offshoots, such as the runners of a Strawberry, by running water and rain, by animals, such as bulbs in the cleft feet of cattle, by birds, eating fruit the seed of which subsequently germinates, and largely by wind.

Many plants have special expulsive apparatus. The Squirting Cucumber expels its seeds with great force through the hole left by the stalk when the fruit drops off. Impatiens noli tangere, or Touch-me-not, is so-called from its habit of violently ejecting its seeds. The exploding pods of furze, too, are well known. Hura crepitans and Bauhinia are able to throw their rather large seeds as far as 15 yards.

We have all seen how the Spinifex is blown along the sand with a high wind on the Brighton Beach.

Seeds are often conveyed long distances by the wind; some from their dust-like smallness, and many from being provided with hairs or membranous wings.

The Hop, Lime, Hornbeam, Ailantus, Sycamore furnish examples of winged seeds; Dandelions, Thistles, Valerian of tufts of hairs acting as parachutes.

Many fruits and seeds have sticky surfaces, or recurved hairs, or hooks, by which they adhere to the skin or wool of animals. Martynias are examples on a large scale, the spreading horns being 5 in. long and tipped with hard, very sharp recurved points.

It is lamentable how little has found its way into books on the life history of Australian plants. This is a field that would absorb the energies of a good many.

Look at the subjects offering themselves:

The fruits, in the botanical sense, of native plants.

Contrivances to avoid self-pollination, or when cross-pollination fails to bring this about.

The dispersion of pollen, seed, and fruits.

The arrangement of colors to attract insects.

The scents used to attract or repel insects.

The devices to keep off injurious animals and insects.

The time of opening and closing of flowers.

The seasons of flowering and fruiting.

The contrivances to avoid drought and heat.

The arrangement of leaves on the stem, of flowers, of leaves in the bud, foliar, and floral.

The length of time seeds remain on native trees; sometimes, it is said, until the tree itself dies.

And—a very interesting subject—"Teratology," or what gardeners call sports." Anthers growing into petals, stamens into pistils, ovules into leaves, flowers turning green, stems spreading into flat expansions, leaves forming tubes, petals exceeding or falling short of their proper number, irregular flowers becoming regular, one flower growing out of another, &c., &c., the textbook for this being by Dr. Masters, in the Ray series.

Flowering Plants and Ferns.

One of the Cambridge Natural Science Manuals is that devoted to "Flowering Plants and Ferns," by J. C. Willis, 2 vols., 10/6. The first volume describes the different parts of the plant from root to flower, giving much interesting information as to modes of pollination, climbing plants, insectivorous plants, classification, uses, &c. The recent investigations of German botanists are largely availed of, and while there are no illustrations diagrams are freely used. The second volume is arranged as a dictionary of orders and genera, and by means of symbols, contractions, small type, and thin paper an immense mass of information is compressed into a small compass. Thus, under the head of Campanula, we are told that the name was adopted by Linnaeus from Tournefort; that it belongs to the Campanulaceæ; that there are about 240 species found in the north temperate zone, chiefly in the Mediterranean region; and that eight species are found in Great Britain. The commonest species is the Campanula rotundifolia of Linnæus, the blue-bell of Scotland and hare-bell of England. The pollen is shed in the bud, the stamens standing closely round the style, and depositing their pollen upon the hairs. As the flower opens the stamens wither, with the exception of their triangular bases that protect the honey, and the style presents the pollen to insects visiting the flower. After a time the stigmas separate, and the flower is now female, and finally the stigmas curl right back on themselves, and so effect self-fertilization. See order and compare Phyteuma and Jasione. (The account of the order takes up a whole page.) The seeds are light, and are contained in a capsule, which, if erect, dehisces at the apex, if pendulous at the base, so that the seeds, as is often the case (compare Papaver) can only escape when the plant is shaken; for example, in strong winds. Several species are cultivated, Canterbury Bells, &c. In the book the above occupies $1\frac{3}{4}$ in., so that the matter in 400 pages can be estimated. The book can be strongly recommended to the student.

"The Australian Gardener."

..SOME..

Press Opinions.

"The August issue of 'The Australian Gardener' is an excellent number."—*S. A. Register.*

"While 'The Australian Gardener' deals mostly with the cultivation of flowers and fruit, it does not neglect other phases of gardening operations, which, with scientific botany, are dealt with by a careful selection of contributors and specialists."—*Mt. Barker Courier.*

"'The Australian Gardener' is excellently printed and illustrated, the illustrations being specially fine. It consists of twenty pages, and contains much useful information."—*The Laura Standard.*

"'The Australian Gardener' is a new monthly journal for the special information of those who are interested in all branches of horticulture, and serves to give a higher class of instruction to amateurs than is usually provided in this class of journal. It is well got up, and is published in Adelaide."—*Omeo Standard* (Vic.)

"'The Australian Gardener' tells you exactly what you need to know each month; its information is from the best sources; it is well printed, and the subject matter is well arranged. The August issue is of special interest to gardeners in public and private grounds, and also to those who find pleasure in pretty surroundings for the villa or cottage. The articles are 'Garden operations for the month,' 'Bulbs,' 'Carnation growing in America,' 'Cinerarias,' 'The Fuchsia,' 'Ornamental Shrubs' 'Hints for the Glasshouse,' 'The Flannel Flower,' 'Magnolias,' 'Cyclamens,' and 'Transplanting.' There is also a fine article dealing with the United States experiment stations that have made America a phenomenon in the natural history of the world. The magazine is a marvel of cheapness."—*Cobden Times* (Vic.)

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A. J. R. WIMBLE, A.I.A., S.A.,
Manager for the Proprietors of "The Australian Gardener,"
61, Brookman's Building,
Grenfell Street, Adelaide.

Shows to Come.

MARCH

5, 6, 7—Royal Agricultural and Horticultural Society, Adelaide. Annual Autumn Exhibition, Jubilee Exhibition Grounds.

26, 27—Ballarat Horticultural Society. Autumn Show.

APRIL

S.A. Horticultural and Floricultural Society. Adelaide Town Hall, Chrysanthemum Show.

The Australian Gardener.

MONDAY, MARCH 2, 1903.

EDITORIAL.

The March number of "The Australian Gardener" contains articles of special interest. First under notice is a picturesque description of floral pageantry. The concluding number of the description of St. Vigeans makes the series replete with information upon the cultivation of ornamental trees and shrubs in a gentleman's garden. We would commend to the notice of readers a lengthy article upon "Bulbs," which are to be planted during this month. The information supplied by Mr. Pascoe is crammed full of practical work such as only could be supplied by the experience of many years. We regret having to hold over a number of articles that are in type, ready for publication. Our contributors must understand that our space is limited, but we welcome contributions of a practical character, and shall be pleased to publish them as opportunities permit.

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PER YEAR

The Floral Pageant of the Year.

The procession is passing—the gay procession of flowers. Flowers of every blush and scent are uniting in splendid federation to make the scene one of dazzling magnificence and unsurpassed brilliance. The garden is glowing with every conceivable tint. Flora is shaking her horn at first with a light sprinkle and then with more and more reckless liberality. She is emptying it to the dregs, but the dregs are golden dregs, the crimson and gold and Chrysanthemum tints of autumn. Where to begin? The Roses, by virtue of their royal estate, claim precedence. How incessantly they have bloomed, and with what heroism each delicate flower braves the fierce sunlight and relentless wind! If by the evening time they have succumbed, every fresh morning finds them once more fresh and smiling with dewdrops trembling on their petals as though with tears they besought the sun and wind to be merciful. Roses have no understudies, if they are absent their places cannot be supplied. Among the aristocracy of flowers surely Salvia Patens must be a high-born beauty, a peeress of the realm. How peerless its blue! How velvety its texture! And what a telling color this same blue is in the border! It arrests the glance immediately and imperiously demands a lingering gaze of admiration. The Gentian, the darker Lobelias, and the exquisite Delphinium Formosum have the same sapphire brilliance. The other Delphiniums have a more azure hue, softening into lavender. All have a rare beauty of their own, and impart an air of distinction to any garden, be it ever so humble. For absolute purity what can compare with the White Perennial Phlox. Behold it everywhere "dressed like a bride" and thrusting its large, luminous heads of flower through the surrounding leafage! Having insufficient foliage of its own, it appropriates that of other plants as a set-off to its matchless charms. Its sisters are emulating it in various parts of the garden with less purity, but perhaps with more showiness. For fresh delicacy of tint commend me to the Balsam. They comprise, too, such a host of shades, and the double varieties are Camelia-like in their form and texture. Flowering uninterruptedly, they are a boon to the borders. If they have one fault it is modesty, keeping their tender blooms, like chickens, half hidden under their wings. Cockscombs intermingle their vivid hues. Nasturtiums have wedged themselves wherever a cranny could be found, and delight one with their ochre shades and rich brown stainings.

What a blaze the Salvia Bonfire makes! It is almost too fiery a vision for a contemplative gaze. From this dazzling display the eye wanders for relief to the soft toned grasses. How they blow this way and that and shimmer in the sunlight! How they toss their fluffy plumes! The feathery flowers, too, droop in a cascade over the border. There is always a stir, a rustle, a wonderful restlessness among these gold and silver and delicately-tinted greens, while

> The plumed insects, swift and free,
> Like golden boats on a sunny sea,
> Laden with light and color, pass
> Over the gleam of the living grass.

Cool is the gleam of the silver Artichokes and classic their forms. Cool are the sweeps of lawn. A sea of green with coves, inlets, and bays along the coastline of the flower border, and cool indeed are the shadowy depths in the recesses of the trees and creepers. It is difficult to imagine a summer border without the irrepressible, ubiquitous scarlet Gladiolus rearing its slender stems aloft. If it is somewhat unappreciated nowadays it is because of the vast superiority of the Cannas. How can one sufficiently laud this grandly decorative family, whose varied tropical foliage alone would render them indispensable! And then the brilliant magnificence of their blooms! How Australia glistens! What a flare Italia makes, now Pandora glows, and how sweet and soft by contrast are the apricots and salmon tints of the varieties! In a distant corner Tecoma Mackenni is widely distributing itself, flinging long, lissome shoots over everything that happens to stand in the way. Pillar, wire, and fence it takes complete possession of, ignoring the claims of other plants. Then as though to justify its presumptuousness it covers itself with bewitching sprays of exquisitely delicate pink blossoms. Of course, one cannot be angry with it after that; the only thing to be done is to remove its neighbors and extend its domain. The rival belle of the family, T. Grandiflora, is manifesting similar propensities elsewhere and enchanting with the rare beauty of its apricot-tinted blooms.

We are under another deep obligation to Japan for the little Convolvulus that is twining and festooning itself round many a tree and pillar after its own aspiring fashion, encircling everything in its ascent, and making a prodigious show with its richly-tinted chalices. Surely these floral importations must have influenced the English Government in forming an alliance with Japan. Horticulturally we have been allied for many years. Banish Japan from our gardens, and they would be shorn of half their glory.

What a medley of shades everywhere! Were one to name them they would read excruciatingly, and yet they agree amicably, and all is harmony. Some majentas have crept in, too. Despised majentas, those poor relations that always turn up unbidden at the feast. They have established themselves quite gaily side by side with scarlets, crimsons, and pinks. They would perhaps screech at each other, and we should see the feathers fly but for the kindly intervention of some foliage whose mission it would almost seem is to pacify combative colors, and to reconcile discordant tones.

Sunflowers, Rudbeckia, Calceolaria, Eschscholtzia, Hunnemannia, Gaillardia, in tones of gold, orange, and lemon all make a dazzling display. A regiment of Hollyhocks has distributed itself all over the garden. Each flaunts its gay rosette with justifiable pride.

There is a blur of soft shades confused with green. It is a mass of Salpiglossis. One has to approach them to be able to appreciate their delicate beauty, unique shades, and rich dark pencillings.

Above a canopy of creepers, the Virgin's Bower, with its feathery bloom, is poised lightly like a cloud. Here and there the dense growth of intermingling greens is starred with Jasmine flowers.

Brightly gleam the Bouvardias, dazzling white, more faintly the choice blooms of Nerium Album Plenum. The dusky Magnolia carries its countless lamps, which cast a subdued light and fill the air with spice. Partially hidden by its luxuriance of leaves "the Golden Chaliced Crocus burns." It first begins to peer in February, and its lustrous blooms are the harbingers of autumn. It is the first to toll the knell of parting summer.

Flower Garden Operations for March.

Continue to maintain an attractive appearance in the garden by unremitting attention in the matter of removing dying blooms, seed pods, damaged shoots, and all untidy matter. Beds and borders composed of herbaceous plants and annuals should have regular soakings of water, and the grosser feeding subjects should be frequently given liquid manure. Tie up plants afresh that have broken from their confinement or have outgrown the strength of the original stake. With these little attentions the garden should afford delight for another two months. It is fatal to procrastinate in the matter of noting the colors and especial features of the various Dahlias, Cannas, and other decorative subjects. Each should be clearly defined and labelled before they go out of bloom and are assigned their winter quarters, so that next spring there will be no mistakes made in disposing of them, and they can be grouped to the best possible advantage. If ones collection is not sufficiently large and varied now is the best time to make a fresh selection at some nursery garden. It is much more satisfactory to have the order booked now than to leave it until the planting season arrives, when one has to rely on the florists' catalogued description, which, though helpful, is not quite all that we desire. The most important thing is to see a plant growing before we can judge of its suitability to our own taste and surroundings. In the case of Dahlias, some varieties that justify glowing descriptions in the catalogues and are conspicuously handsome features of the flower shows are quite ineffective in the garden, because of their imperfect habit and an irritating disposition to droop and conceal their blooms. Where the collection must necessarily be small it is advisable to exclude the dusky shades, and give preference to the bright showy varieties of Dahlias.

During the month many herbaceous plants can be propagated. Amongst others, Hollyhocks, Pentstemons, Antirrhinums, and Gaillardias from seed, Petunias, Fuchsias, Verbenas from cuttings, Calceolarias by offsets and cuttings.

Seeds of Pansies sown in January and February can now be transferred to the open border. The soil should be well dug and enriched with manure before planting them out. They like best a well manured sandy loam. Sow seeds of the following hardy annuals to come on in the early spring and summer: French and Shirley Poppies, Lupins, Phlox Drummondi, Lobelia, Nemophila, Stocks, Virginian Stock, Larkspurs, Delphinium, Minor Convolvulus, Sweet Sultans, Cornflowers, Eschscholtzia, Coreopsis, Candytuft, Dianthus, and D. Barbatus, Gaillardia, and G. Lorenyiana,

Sow Sweet Peas also this month in a well manured, deeply dug loamy soil. They should be sown in trenches to admit of their being earthed up at various stages of their growth. Autumn sown Peas make a much stronger root than those sown in the spring, and come in to flower much earlier. Additional sowings can be made in the early and late spring, and thus a succession will be provided for.

March is a month very commonly chosen for bulb planting. Those who have left that operation until now should proceed without delay. It is not advisable to plant Narcissus bulbs promiscuously in the borders. They dislike the heavy dressings of manure that the latter must have, and the constant soaking of water in summer is more or less injurious. Moreover, they are greatly in the way of the autumn cultivating, and hinder the progress of the spade. Bulbs, more especially the Narcissus, should be relegated to the kitchen garden or rear garden. The blooms may be a temptation to the "bottle boys" and similar visitors, but happily we can protect ourselves from such depredations by picking the flowers in the full-bud stage, allowing them to open indoors. In allotting them a space to themselves, we can have full control of the soil, and can renew it with little difficulty as often as the health of the bulb requires it; in most cases every two or three years. The soil should be light, deep, and pure. Black sand is favorable, and an admixture of sea sand is said to be very acceptable to the bulb. If a soil is made for them with manure it must first have all its stimulating properties taken out by some gross feeding crop. It will then be in a condition to receive the bulbs. A cool subsoil is of the greatest importance. The rule in planting bulbs is three times their own depth in the soil, but it is better to err on the side of deep than shallow planting in this climate, except perhaps in the case of a heavy soil. When it comes to making a selection of Narcissus for planting it is a more difficult matter. The varieties of the Daffodil section especially are so numerous and beautiful as to be bewildering. Daffodil shows have their uses in familiarising us with the various types and helping our choice. It is always as well to note on those occasions any that seem to recommend themselves to our individual tastes. Another good way, though, perhaps, a little more extravagant, is to buy the pots of flowering Narcissus that the florists offer in the season; then we know exactly what we are getting. This is advisable, more especially in the case of the choice varieties. They can be transferred from the pot to the bulb bed without their ever feeling the removal.

Answers to Correspondents.

"KITCHEN."—An early sort of peas and broad beans may be sown towards the end of the month. Also sow lettuce, radish, spinach, cabbage, cauliflower, turnip, parsley, carrot, parsnip, and onion. Plant largely of all the cabbage family and celery. A planting of potatoes may also be made. Draw the soil to celery as it grows.

"FLOWERS."—Plant all spring flowering bulbs. Make a good sowing of hardy annuals, finish planting biennials, divide and replant violets, primroses, polyanthuses, and other spring flowering herbaceous plants; put in cuttings of all bedding plants; also roses, and keep all flower borders well forked up to encourage moisture.

"FUNGOID."—On specimens of leaves of carnation marked A and B the diseases found were as follows: A. Carnation rust (Uromyces caryophyllinus (Schrk Schroet). B. Carnation fairy ring (Heterosporium echinulatum, Cke.). As to the rust, some varieties are more liable than others, and it has been suggested in propagating the sorts liable to disease that extra care should be taken in the selection of the cuttings, using only those free from disease and from the plants least seriously affected. As to the fairy ring, picking off the diseased leaves is the best policy, and the same course may also be followed with the rust, remembering, of course, that work of this nature is more effective when done at the commencement of the outbreak. Also in watering avoid wetting the leaves, as this favors the spread of the fungi.

"GRENVILLE GLEN."—In the paragraph you mention the word "so" is a printer's error for "and." The staking of asparagus is commonly practised with plants from which seed is desired, and to young one or two year old plants. The object is to prevent the wind from bending or breaking the stems. In the former case, the seed could not come to such perfection as required; and, in either case, the latter more especially, it is apt to cause injury to the crown and interfere with the development of new shoots. The best French authorities recommend growers to save their own seed, thus having the opportunity for making a better selection of crowns and rejecting inferior ones. The latter part of the paragraph referred to the case of young plants requiring a certain amount of water in a very dry season.

"T."—The climatic differences in the States as affecting gardening operations is a matter that must be left to the intelligence of readers. The variation is not so very extreme as between Victoria and South Australia that advice is likely to be misleading. As a matter of fact, localities and climate in Australia vary in a small radius considerably, but not so much as the intelligence of gardeners.

"SOL."—It is quite true that the advice upon gardening with particular flowers in America, England, and Europe is not suitable or applicable in every way to Australia. It was hardly expected that gardeners, or even those who are not gardeners, would suppose for a moment the advice should be followed literally. The object of their publication is to show how specialists succeed in their triumphs of beauty, and their devices are left to the wisdom of growers to apply according to the different conditions of climate, soil, and so on.

"UNLEY PARK."—The vague description given is utterly insufficient to say what kind of insect is meant. Kindly send a few specimens, and we shall be very pleased to supply the information.

"BALSAM."—Some varieties of Balsams have a distinct perfume. A visit to the Botanic Gardens will give you all the information you require.

"CHRYSANTHEMUM."—Yes, during this month. Cowdung, with a little soot added, placed in a bag and hung in a tub of water, squeezed until the colour of dark brandy is obtained, is the safest liquid manure. Use about twice a week, alternating with pure water.

"MILDEW."—Dust your Chrysanthemums with sulphur while the dew is on them.

"JAPS."—Take the crown bud, not the terminal, in that case.

Single Pyrethrums.

Single Pyrethrums are preferable to double ones for indoor decoration, for the simple reason that they are lighter, and more varied in colour, some of the tints being soft, and hamonising better with the furnishing of a room. This is on the authority of a lady who has had considerable experience in the floral arrangements of tables. However beautiful some of the double sorts may be, they are clumsy looking in comparison with the single sorts. Most of us think of growing Pyrethrums from division, but seldom think of the less expensive way of propagating from seed. This may be done by sowing in a frame.—"Gardening."

GLADIOLUS PAST AND PRESENT

TO THE EDITOR.

Sir—Hybrid of Gandavensis was the first important class that was devoloped by means of hybridisation, and cross fertilisation. For many years, up to the present day, the origin of Gandavensis was in doubt, and remains a question for dispute. Botanists have ventured some explanations, but the matter is still undecided, and like many another subject of disputation in origin, it will probably remain a mystery. Louis Von Houtte, one of the most prominent horticulturists in the world, gave the origin as being a seedling raised in the garden of the Duke of Arenburg, while another celebrated authority solved the problem by stating that it was the result of a cross between the species, or types, Cardinalis and Psittacinus.

This solution might have been regarded as a settlement of the dispute, had not another undoubted authority, the late Hon. Rev. William Herbert pointed out that Von Houtte was in error. After repeated trials to hybridise the two species named Herbert failed and announced that it could not be done, and moreover Van Houtte's efforts were acknowledged as a mistake. So the English authorities agree with Mr. Herbert that the origin of Gandavensis is obscure There is no question, however, upon the fact that to Gandavensis we are indebted for the development of the choice varieties that we have at present.

Botanists have paid much attention to the Gladiolus, [for the past fifty years, but the greatest improvements have come to us within the latter half of that period. All the varieties cross with the species, so that new types are constantly appearing, and each has some mark of superiority either in form or colour not possessed by the parent. But why crosses should have this effect is one of the mysteries past finding out. If the mystery exists in order to stimulate a love for the beautiful in floral form and loveliness, and to exhibit the fact that there is no limit to development in the floral kingdom, the object is certainly attained to the fullest degree. It is a common error amongst gardeners to call our present new varieties hybrids, which are really only crosses between species. The first cross is but the commencement of the development in the flower. Every cross between well known varieties tends in almost every case to improve not only the beauty of the flower but vigour of the plant. Of the now famous seedlings described as Groff's world's best hybrid it is stated that all the former mixtures are superseded by the European types of recent introduction. Here authorities are found to disagree again. Mr. Crawford, one of the leading horticulturists, says, regarding Groff's varieties that they have no prominent characteristic that distinguishes them from all other classes. They come from judiciously selecting and crossing the best varieties of all classes that have been produced by the leading men of the day. The term, hybrid, therefore, as used is held in dispute. It is argued that they should not be termed the world's best hybrid seedling, but seedlings from the world's best hybrids. I wish it clearly understood that I do not say one word against them, as I consider them very choice. I have myself about 500 of these varieties, and are looking forward with pleasant anticipation to see them blooming next month. Mr. Groff has done splendid work in developing new varieties, and amongst a score of other growers Kelway's, with their seventy years of experience, who who have probably the largest collection of varieties in the world, and Vilmoni, in France, may be mentioned with their magnificent collection. The results of the labours of such specialists are not obtained by the magic touch of a fairy wand to tap a flower and say blue, red, or any other colour. It is the result of extreme care and consistent work, as I have proved by years of experience. The work of years, however, brings with it ample reward in this flower, which I am pleased to note is fast coming into popularity as one of the gems of beauty in all our gardens.—I am, Sir, &c.,

Mt. Victoria. L. H. HOWELL.

Gladiolus.—"The Mountain Maid."

KERNER'S NATURAL HISTORY OF PLANTS, WITH NOTES BY S.

TO THE EDITOR.

Sir—In your issue of 1st ultimo, p. 18, and the review therein by "S." of Kerner's "Natural History of Plants," reference is made to Cœlobogyne (Alchornea) ilicifotia in these words:—"It was introduced into Europe in 1829, and continues to bear fertile seeds . . . although no male flowers have ever been detected." I would remark here that this theory was discovered to be an error, long since, by myself, when one day I carefully examined a plant here, in the groupings of Queensland and N.S. Wales trees and shrubs, with a powerful pocket lens, and, finding several diminutive flowers, saw at once they were pistillate; but, to my surprise, growing on the same plant, a small branch was found containing a few male flowers, and these possessed sufficient pollen with which to fertilise all the others. I then submitted the facts to Sir Joseph Hooker, Director (at that time) of the Royal Gardens, Kew, London, and he quite agreed with the conclusions which had been arrived at from such undoubted evidence.

I am, Sir, &c.,
W. R. GUILFOYLE.
Botanic and Domain Gardens,
Melbourne, Feb. 5, 1903.

[We have to thank Mr. Guilfoyle for his observations upon this article, and would point out the opportunity therein suggested for Australian botanists to note any possible differences that may exist between flowers grown under cultivation in European conservatories and those in their natural habitat.—ED.]

DISEASE IN CINERARIAS.

Cinerarias, like many other soft-wood plants, are subject to go off just on the surface of the soil. The best preventive is plenty of fresh air and a judicious application of water, especially during the short days of winter. If the plants are too crowded it will almost certainly be productive of mischief. Better grow fewer really fine specimens that will produce a handsome display of superb flowers than attempt a large number of feeble plants that will prove unsatisfactory. The great pest of the Cineraria is the green fly, and tobacco smoke is the best remedy for this pest. The most effective means of preventing this pest's appearance is to fumigate the plants at intervals of not more than two or three weeks with tobacco smoke. Care must be taken, however, to see that the leaves of the plants are dry before commencing fumigation; otherwise the effect of the smoke might be to scorch the leaves which are damp.

The secret of growing Cinerarias well is to keep them growing from the seedling to the flowering pot, with freedom from insect pests; never allow them to get a check by becoming pot bound, or to suffer for want of water.

The double varieties require exactly the same treatment as the singles.—M. Cullen.

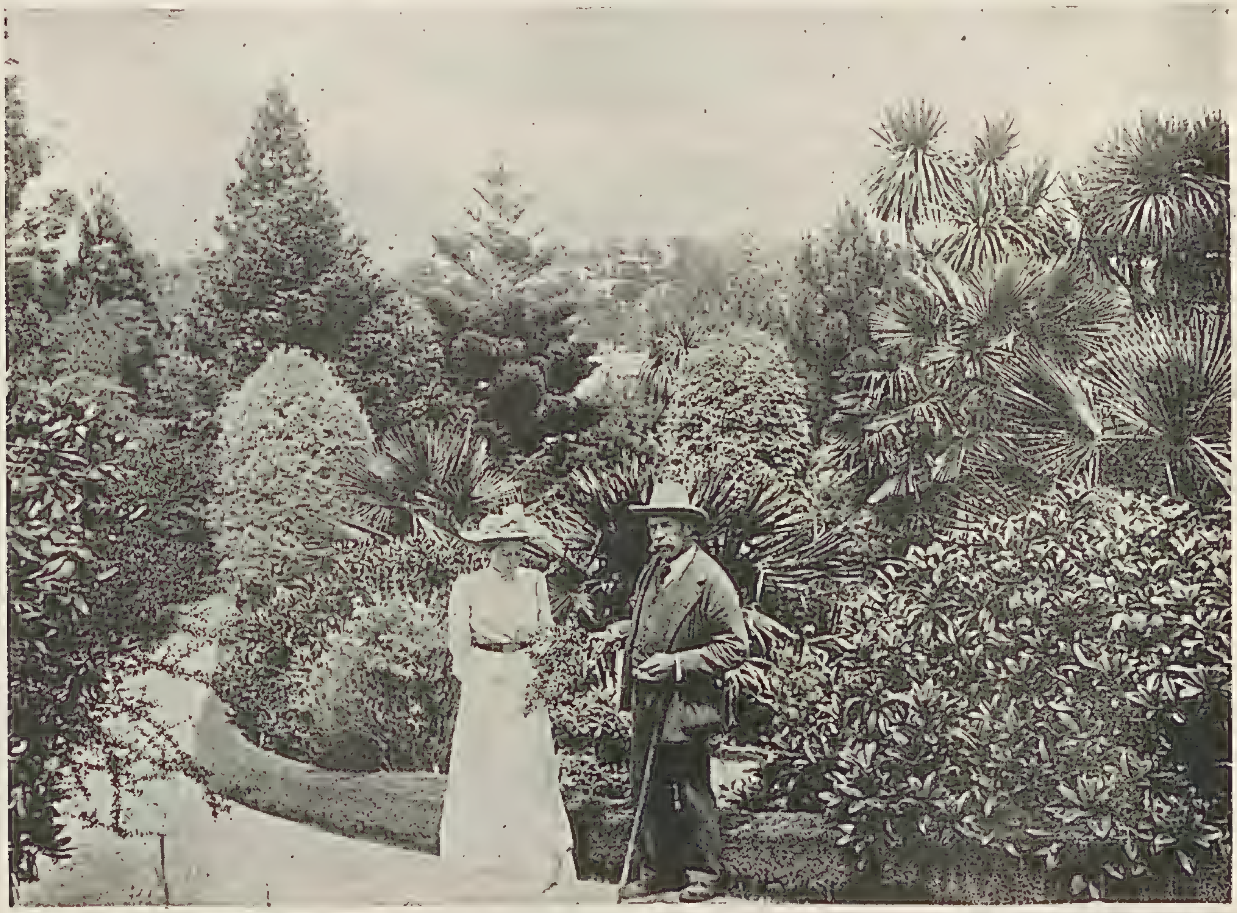
TO SAVE SEED OF CINERARIAS.

Take the best flowers, those which are intended for seed purposes, and separate them from the general bulk of plants; if possible, place them in a separate house to prevent them being crossed by the operation of bees. The result of not doing this has been illustrated in my own case. I nearly lost the good strain of Cinerarias which I had produced through not paying strict attention to this practice.

On one occasion I simply took the seed from the best flowers in the general bulk, containing singles and doubles. The bees inoculated them, and I found the result of this to be that the greater bulk produced semi-double flowers and singles, which were of the poorest quality. Fortunately, I happened to have some of the original seed by me, which enabled me to preserve the strain.—M. Cullen.

ST. VIGEANS.

By the time we have finished our ramble through the gardens of St. Vigeans we feel sure our readers will agree that Dr. Stirling has grown a perfect little paradise of interesting trees and plants around his home. A place where the young may study and learn, for everything is hall-marked with its proper name, and where visitors of mature years may wander, never failing to find something of interest, and at the same time add to their knowledge.



[Kindly lent by proprietors "Adelaide Observer."]

Dr. Stirling and Miss M. Stirling.

We left our readers at the lower entrance gate. The path itself leading round the foot of hill first claims attention. A gentle slope, the natural dark soil carpeted with a strip of golden-colored gravel, leaving an edge of a foot or so on each side has a very striking effect. On the right-hand is the hill covered with a mass of variegated foliage, an idea of which may be gathered from the description of beautiful trees and shrubs in our previous article. On the left hand is the flat, containing two shadehouses, a water pond, and plots of flowers. Bordering the path on the right are elms, maples, and oaks intertwining their lovely foliage branches, while the bordering on the left contains a large collection of Japanese maples, the two borders making an avenue of rare beauty. The maples are planted round a large bed of Rhododendrons (from rhodon, "a rose," and dendron, "a tree"), and their closely allied family of Ghent Azaleas. Dr. Stirling has for years taken great trouble, and spared no expense to get his show of Rhododendrons as complete and good as possible. Visitors from far and near travel yearly to St. Vigeans to see this collection, and the doctor in his visits to England has made fast friends in Rhododendrons with the Waterer family, who are probably the most noted growers of these floral beauties in the world.

The picture presented is from a photograph taken while the bed was in full bloom, and gives an idea of what a mass of beauty is exhibited there. To realise it better all the white blooms in the picture must be turned into a variety of deep rich colorings, and lovely tints, from white through the various shades of red, from the palest rose to dark plum color, set in a beautiful green foliage, intermingling just enough to enhance the beauty of the scene. The plants are all strong and well grown, and we attach a list of some of the most noteworthy;

Clementina Walsh: Rose.

Everstiana: Lilac.

Sappho: Blush white, blotched maroon.

Marquis of Waterford: Bright pink.

Mum: White.

The Strategist: Pink.

Fastuosum fl., pl.: Lilac, half double.

Beauty of Bagshot: White with dark eye.

John Waterer: Brilliant carmine.

Kate Waterer: Rosy crimson, yellow blotch.

Nero: Dark purple, pretty spots.

Concessum: Bright rose, light centre.

Lord Wolseley: Scarlet.

Madam Carvalhio: Blush, with greenish spots.

Mr. John Clutton: White.

Princess of Wales: Light purple, light centre.

The Queen: Blush white.

W. E. Gladstone: Deep rose.

Pink Pearl: Rosy pink, with an immense truss measuring 9 in. across the base—the gem of the collection. This, Messrs. John Waterer declares, is the finest Rhododendron he has ever produced.

After feasting the eyes upon this beauty spot of magnificent bloom we take the path to the left which leads to No. 1 shadehouse, and a peep into this reveals a beautiful lot of Begonias, and some newly imported Rhododendrons. Among the Begonias are some lovely blooms of varying shades. There is something about the richness of coloring, the well-formed character of the Begonia flower, and the splendid foliage that gives a distinct impression that it belongs to the aristocracy of plant life. It is a little surprising that more of the enthusiasts in floriculture do not pay more attention to them.

Leaving the shadehouse, we note the border on to the boundary fence has some specimens of Cordyline nutans, Japanese maples, birches, and copper beeches to adorn the surroundings. Close at hand, between the two shadehouses, is the pond. A nice sheet of water about two chains long by half a chain wide, at a rough guess. This part of the garden has some claim to picturesqueness, and our artist has succeeded in catching a nice view of it. Here the Nymphæas spread their broad leaves, lazily floating on the still water, and the wax-like blooms hold their pretty heads up to the sunlight. The evaporation from a sheet of water like this is considerable, and to regulate the immersion of the plants they are placed in pots suspended on wires. which can be lowered to the required depth, and otherwise receive attention. While the water lilies lie undisturbed upon the surface the grasses grow high above them and waive their nodding heads to the breeze that rustles the foliage of the stately bamboos and the stiffly growing New Zealand flax. Here, too, the Irises (Kaempferi and Aurea), with a luxuriant growth, dip their leaves in the refreshing pool, while the Cannas luxuriate in their splendid foliage and rich reds and yellows. Vieing with these are the great green leaves of the Arums and their snow-white spathes. Holding its own amongst the others for luxuriance of foliage and beauty of flower is the Agapanthus, whose dainty sprays of pure white or of blue flowers stand up on their long stems to catch admiration. These beauties are singularly attractive, and their value also lies in the power of vitality they posses to defy the withering elements of weather and sun. As cut flowers for buttonholes or decorative purposes they have few equals. Then there are the great Daisy bushes, with their profusion of clear white, looking charmingly cheerful amidst the wealth of green. In all this variety of foliage there surely would be something missing if the Pampas (Gynerium) Grass were not in evidence. But there it is, like a final touch of beauty, with the fine waving plumes of elegance, than which few things could look superior in such surroundings. It is difficult to turn one's back upon this place, and though we did not see pæonies in flower, the pretty water scene irresistibly recalled Shakespeare's description by Iris in "The Tempest," of the lurking, sequestrated nook, where Ceres makes "cold nymphs chaste crowns" by "banks with pæonied and lilied brims." Some authorities dispute the rendering of this passage, but the idea suits the poetic fancy of the moment here, and we care not to question the translation.

St. Vigeans.—Rhododendrons in Bloom.

We now take a turn into shadehouse No. 2, and here again the favored Rhododendrons prevail. Here is a list of some of the Himalayan beauties, to which the house is devoted, as the variety will not stand exposure to the summer sun.

Griffithianum, syn. Aucklandi. This variety attains in its natural state in Sikkim, Him., 20 to 30 ft. Its magnificent blooms are 5½ in. in diameter. Maddeni, syn. calophyllum. This also carries itself at home to a height of 30 ft., and throws lovely white trusses of bloom. We note, too, Fulgens; Campylocarpum; Grande, syn. Wilsoni; Cinnamomeum; Arboreum; Falconeri (very handsome in foliage); Thomsoni; and the native of Burma, Veitchianum, which seems to make itself quite at home. Varieties of the Himalayan species are Sesterianum, Countess of Haddington, and Sesterianum. A splendid collection, all looking well. Before passing out we notice a Tasmanian Laurel, Anopteris glandulosa, doing well, and that very handsome climber, Lapageria rosea. Before leaving the Rhododendrons we must not forget to note the compliment paid to Dr. Stirling by the famous Waterers, who have named a variety Mrs. Stirling, and the beauty is worthy of attention.

On the outside of the house that pretty delicate white Clematis, Mrs. Bateman, challenges attention, as does the luxuriant bed of Lilies of the Valley. The flower beds adjoining the house are tastefully laid out with Shirley Poppies, Asters, Pansies, Stocks, Cannas, Cornflowers, Gladioli, Dahlias, and others, with copper beeches, surrounded by a laurel hedge.

We now begin the ascent of a zig-zag pathway up the side of the hill to eastern side of the house, and on the way we note the care with which the planting of trees, shrubs, and flowers has been done. One or two turns of the path are enough to agitate one's breathing apparatus, and is worth waiting a moment to take a long breath, and from the elevated position get a bird's-eye view of what we have just been describing. The only bit of landscape picture in the garden, and what it lacks in artistic design is compensated by its general beauty. During the course of this journey, which will take a long time if everything worth seeing is to be noted, we found that our genial host had a personal interest in every growing thing there. He was most patient in questionings, even to the simplest query, and brimful of historical and botanical knowledge of his favorites. What we heard would fill a book, and an interesting and instructive book, too, but we can give only a few of the best. Happily there is no fear of jealousy among those that may be left out, though they may be more worthy of mention.

Rhus succedanea (Red Lac Sumach) is a fine specimen, 6 ft. high. This is particularly handsome during autumn, when the leaves change from green to a vivid scarlet. Opposite is a neat little Rhus lanciniata, with leaves finely cut, resembling parsley. Like the other, it carries a brilliant red autumnal hue. Acer variegatum is a recent introduction to St. Vigeans. The leaves are green, mottled with white spots, and it remains to be seen if its delicate mottling will resist the burning of a hot summer. Amelanchier Canadensis is another rare plant rarely met with, and the doctor is just a little vain over it. Well he might be, too, for it is a perfect picture in its spring dressing of drooping panicles of pure white flowers, or in its autumn foliage of red. It also bears a miniature pear-shaped fruit, with rather a pleasant flavor. Boronia pinnata is undoubtedly the showiest of all Australian Boronia flowers, with its profuse and delicate pink bloom. The Scotch Heather, dear enough no doubt to our host, is represented by Erica vulgaris (pink and white), and the Irish Heath by Menziesia polifolia, and both look quite at home in their adopted country. On the edge of a bank, in its dwarf spreading habit, is a plant of Phlox subulata, and its snowy whiteness in a spring sun is quite dazzling. A little conifer, Cupressus Lawsoniana aurea, is a 6 ft. growth of bright golden color. About three times that height, and stately enough, is Liquidambar styraciflua (sweet gum-tree, or Belsted), with its dark green star-shaped leaves and cork bark. This is a beauty, and when known its probable destiny is to become one of the finest and most popular trees in the hills. Its form is pyramidal, well adapted for avenues. Its leaves in the spring, carry a refreshing fragrance, and in the autumn assumes rich tints of yellow and red. Betula alba purpurea (purple birch) is rather a striking tree, with its black purple foliage and drooping habit. Acer purpurea (purple maple) is also a comparatively new arrival. It is already some 10 ft. high, and the dark purple coloring of the underside of the leaves is attractive. Another of the same color is the Fagus purpurea, which retains its hue throughout the whole season. A rich golden shade is the 3 ft. of Juniperus Japonica aurea, and the little specimen of Grevillea asplenifolia, carrying its cymes of red flowers, is a member of a splendid family. The showy dwarf-growing shrub, with beautiful ovate variegated leaves, is Euonymus latifolius albus, and the vivid green, close, and erect Cypress, gets its name of Cupressus Lawsoniana erecta viridis, amongst other things, from its upright habit of growth. The small variegated foliage at hand belongs to Pittosporum nigrescens, and that pretty Erica, covered with red flowers, is Erica ventricosa magnifica. There is a Lasiandra Macrantha grandiflora, a most beautiful plant, producing flowers in abundance, from 3 to 4 in. across, of a rich violet color, and the pretty, small-growing shrub, with flowers of pink, borne in terminal umbels, comes from Western Australia, rejoicing in the name of Pimelea decussata (from pimele, "fat," referring to its oily seeds. That bush with the profusion of white flowers, highly fragrant, carries its bloom throughout the summer, having a distinct foliage, is known as the sweet pepper bush (Clethra alnifolia). One of the most interesting of recent introductions.

We are again struck with the beauty of the firs. Another representative of the large family. This is one of the showiest of the Americans. A silver fir (Abies grandis) that can grow to full 40 ft. of beauty. Turn away from that, and you will note the little shrub, again from the West, with flowers of pinkish white. A group of these (Eriostemon myoporoides) we saw pictured in one of the illustrated gardening papers from London, and a lovely design it was. Passing by the Golden Lambert (Cupressus horizontalis aurea), which we previously described, but never weary of admiring, we come upon a white variety of Eucalyptus ficifolia, and close handy is E. calophylla. Australian-born people, to whom the everlasting eucalypts give the monotony, but still some beauty, of Australian scenery, are apt to despise their national tree. They see so much of it. Everywhere they travel, from North to South, East to West, the eternal gums, in some form or other, make them agree with the travellers from abroad that Australian scenery is monotonous. Be this as it may, these same people who are so ready with their opinions, would blush (provided the average Australian be capable of such effiminacy, so-called) at their own judgment were they to be confronted with the trees now before them in full bloom. They are simply grand, and we leave at that with a patriotic feeling of pride.

We are now nearly at the summit of the hill overlooking the house from the western side, and glad of a little respite to take a coup-d'œil of the garden forest, the valley, and hills beyond. Continuing the jour-

St. Vigeans.—Water Scene.

ney, still upward, we come to what is only recently becoming fashionable in Australia—a pergola. It is really the old-time trellis of roses. This overlooks a bed of roses, containing a choice collection. Leading up to this, and beyond, is a row of Prunus Pissardi and Pittosporum Eugenoides, planted alternately. The effect is very striking and pretty. Here is a bed, too, of Ericas that have given the doctor a good deal of alternating satisfaction and disappointment. He finds, as most gardeners do, that Erica culture is an art in itself. In England the gardener who can grow Ericas is the gentleman who puts his own price on the wages list. He is a specialist, and does nothing else. The climatic conditions, however, of the Mount Lofty Ranges is eminently suited to the cultivation of this charming plant, as is abundantly shown here. This bed is a perfect delight in all the daintiest shades and tints of color. The spikes of bloom are very fine, and altogether lovely. Here is a list of some of the chief beauties:

Erica Beaconsfieldiana: Yellow.
Erica baccans: Deep pink.
Erica Bowieana: Pure white.
Erica Cavendishi: Yellow.
Erica Charlesleyana: Pale pink.
Erica cruenta: Deep red.
Erica hybrida: Scarlet.
Erica hyemalis: Pink and white.
Erica mammosa: Bright crimson.
Erica melanthera: Lilac.
Erica persoluta alba: White.
Erica perca: Deep rose.
Erica regerminans: Pale mauve.
Erica ventricosa: Several varieties.
Erica Webbleyana: Rose.
Erica Wilmoreana: Pink and white.

There is still a corner to wander in to the boundary fence, and we note the thorn Crataegus Korolkow) as a recent introduction; a handsome form of Tulip tree (Liriodendron tulipifera), with leaves beautifully margined with a golden band (new); another golden-margined leaf novelty, Forsythia aurea; and a large flowering species, Protea cynaroides. A score or two of other trees, shrubs, and flowers adorn the crest of the hill which we cannot enumerate.

Passing along the tennis court we arrive at a large water supply tank, whose dimensions almost warrant the more dignified title of reservoir, which, from its splendid elevation, makes watering by gravitation through pipes most effective. From this spot a magnificent extent of country is seen stretching away in the blue haze as far as Kangaroo Island, which can be seen under favorable atmospheric conditions.

We now adjourn to further discuss the hospitality of the owner of St. Vigeans, and to offer him congratulations upon the splendid result of his years of labor, or, rather should we say, recreation. A home inside and outside, instructive and beautiful. A catalogue of the garden at St. Vigeans, with comments upon its contents, showing where they all came from, and how they have grown, would be a valuable addition to the library of any gardener and botanist. This necessarily incomplete survey of the place should be instructive to those who have grounds to beautify, whether large or small, and we part from it with reluctance, yet with manifest pleasure upon having had the opportunity of bringing it under the notice of our readers.

Bulbs and Allied Plants.

[A paper read before the South Australian Gardeners' Society by Mr. J. F. Pascoe.]

Among the most beautiful garden ornaments Providence has supplied to us, easily obtained and increased, in this climate generally hardy, or requiring very little cultivation, occupying but little room, at their best when other flowers are comparatively scarce, of all forms and colors, and many of exquisite perfume, why is it so few are grown? Universal favorites, it cannot be they are not admired—our flower shows prove the contrary—nor can it be their price places them beyond the reach of only flower lovers. But whatever the reason is, the fact remains that, excepting a few of the common sorts, bulbs in this State are very little grown. This ought not to be, for much of the beauty and interest of our gardens is derived from bulbous plants, and with a small but judicious first outlay sufficient may be obtained to give our gardens a gorgeous appearance for at least six to eight months of the year. Excepting a few of the choice kinds, they will grow, flower, and increase in ordinary garden soil, and require little or no cultivation, excepting, of course, such as are required for exhibition or special purposes.

One writer says:—"There is a peculiar charm about bulbous plants, arising partly, no doubt, from their peculiar sweetness and beauty, but chiefly, perhaps, from the mystery of their lives—they bloom, fade, and retire underground. Like sensible visitors, they come when wanted, and far rarer merit still, go when not wanted; they hide away as soon as their beauty fades, and are no more seen till a new life of verdure, beauty, and fragrance bursts forth when and where most wanted. The temporary rest of the bulb is also most favorable to its transportion to a new place; it invites removal, and renders it safe and easy."

To attempt to do justice to this subject in an ordinary paper would be simply ridiculous. I must, therefore, condense my remarks to the smallest possible limits, and confine them to such sorts as are most hardy, or can be grown with the least trouble. Time nor space will not permit my attempting to define bulbs and explain the difference between them and corms, rhizomes, tubers, and other fleshy rooted plants, but the words bulbs and bulbous are used in their broadest sense, and are intended to include the whole.

For many of the best known and most popular bulbs, such as Hyacinths, Crocuses, some of the Liliums and Amaryllids, Pœonias, Funkias, Snowdrops, Crinums, Clivias, Nerines, Tuberoses, Tropæolums, and a few others our plains climate is certainly trying, but most of them succeed in carefully-prepared ground, if taken up after they have flowered, and the bulbs stowed in a cool room, or they do well in a shadehouse; but Narcissi, Irises, Gladioli, a few of the Amaryllids, some of the Liliums, Tulips, Ranunculi, Anemones, Snowflakes, Babianas, Ixias, Tritonias, Scillas, the Agapanthus, Alliums, Antholizas, Lachenallias, Moreas, Ornithogulums, Oxalis, Watsonias, &c., are so suitable that they may with safety, or even advantage, be left in the ground for years.

I am continually asked, "How deep must I plant my bulbs?" When in doubt plant deeply. No hard and fast rule will apply, but the following practice is usually adopted:—Scaly and solid bulbs should be planted deep, say from four to six inches, but tunicated or coated bulbs may be planted shallow, almost on the surface, or half buried.

Of all cultivated bulbs, possibly the Hyacinth is the most popular, and, excepting the Narcissus, the most extensively grown, especially in Europe and America, affording support to thousands and delight to millions. Of matchless beauty, unsurpassed sweetness, in immense diversity of color, wonderfully amenable to the most diverse treatment, and enduring hardships of the most severe nature. The noblest of spring flowers, but in this State it is under a ban. In many instances its cultivation has not been a great success, but this is perhaps more the fault of the cultivator than that of the bulb. The Hyacinth is a deep-rooting plant, a gross feeder, and fond of water; therefore it is imperatively necessary (if you want first-class flowers) that the ground be well and deeply prepared, and sufficient moisture be supplied whilst they are in a growing state. It is also desirable that the bulbs should be taken up after the tops have been tied down, and be harvested in a cool room. The flowers, double and single, are produced in spikes on stout flower-stalks averaging six to nine inches in length, and are of various colors, from pure white to almost black, in various shades of blue, carmine, crimson, cerise, scarlet, red, yellow, purple, pink, and violet. The bulbs are cultivated in various ways, one of the most favorite being in glasses nearly filled with water. For pot culture they are unsurpassed, and bear forcing admirably, but when grown in pots it is advisable to have proper bulb pots, that is, pots deeper in proportion to their diameter than ordinary ones. A five-inch pot is sufficient for one strong bulb, an eight-inch pot for three strong bulbs, a nine-inch for five, and so on in proportion. Several bulbs of various colors grown in one pot has a very pretty effect. The proper time for planting is February and March, although they may be planted a month or even two later.

H. Candicans (Galtonia) produces a noble spike rising to the height of three feet, producing thirty to fifty ivory-white bell-shaped flowers. When in bloom is a most conspicuous ornament. For decorative purposes it is most valuable, as it will keep a long time in water after being cut. Other species will be referred to under Muscari.

The Gladioli, mostly indigenous to Southern Europe and South Africa, are admirably suited to our climate; no plants can do better. There need be no further trouble with them after they are planted, as they will remain in the ground and flourish for years. From their great richness and brilliancy of color they form one of the most striking classes of flowers in cultivation, continually increasing in popularity. Of immense variety, not only in color and form, but also in season, a grand display can be obtained for a great portion of the year. Of easy cultivation. No soil seems too poor or any situation too exposed for them. Special attention, of course, is necessary for exhibition specimens. Are admirably adapted for growing singly or grouping, make excellent pot plants, and as cut flowers are not to be surpassed, every flower on a spike even to the last bud developing itself when cut and placed in water. The number of species is probably about fifty, those chiefly grown being Blandus, Byzantine, Cardinalis, Colvilli, Communis, and Ramosus, but growers generally confine themselves to hybrids, those of Gandavensis, itself a hybrid between Cardinalis and Psittacnius, raised by Van Houtte in 1841, being the favorites. From Gandavensis nearly all our best varieties have been obtained, but of late years other species have been taken in hand most successfully, and they are becoming strong rivals of the former favorites. The roots if properly harvested keep sound and good for a long time, and may be planted in succession so as to have a supply of blooms for the greater part of the year. They may be expected to flower in about three to five months from time of planting.

One of, if not the most important, popular, and extensively grown genus of bulbs we have is the Narcissus, and recently become the most fashionable flower in the trade, so much so that the Dutch growers have not been able to supply the increased demand. Quite hardy, thriving as well in the smoky city atmosphere as in the country, and when planted may remain in the ground for unlimited time; admirably adapted for grassy lawns, the flower border, or shrubbery, where they will continue to raise their golden and snow-white heads for years. Suitable for any soil or situation, and very effective in groups or lines, yielding an endless amount of cut blooms for floral decoration (for which the flowers by their habit, beauty, fragrance, and staying powers are especially adapted), with little or no trouble, at a time when other flowers are most scarce, the finer sorts rivalling in size, chasteness, purity, and beauty the Pancratium, and even the Amazonian Lily itself; whilst others are as sweet and as useful for bouquets and wreaths as the Gardenia. Can be most highly recommended for pot culture, and are improved by forcing. The botanical division and sub-divisions of this genus was for a long time in great confusion, no two writers being agreed as to the number of species. It is now generally fixed at 21, and divided into three great groups. Group I.—Magni coronate, large crowns, including the Hoop Petticoat, and Trumpet sections, comprising many grand showy flowers, some of the best being Bicolor, B. Empress, B. Horsfeldi, Bulbocodium, Lorifolius Emperor, Maximus, Moschatus, Princess, and Telemonus among singles; and Pumilus plenus, Capax, Pseudo-Narcissus, plenus, and Van Sion among doubles. Group II.—Medii coronate, medium crowns, including the lesser Daffodils and large Jonquils, and comprising some of the largest, most elegant, and superbly-formed flowers. The whole of this group is exceedingly chaste, and of late have become very fashionable, some of the best being Calathinus, Incomparabilis, and its varieties, Maclei and Odorus single; Incomparable, Orange Phœnix, and Sulphur Crown double. Group III.—Parvi coronate (True Narcissus), small crowns, including the Tazetta or Polyanthus Narcissus, Poeticus, and the minor Jonquils. All hardy and free flowers, and generally powerfully scented. For borders or lawns these cannot be too highly recommended, some of the best being Bazelman major and minor, Floribundus, Dubius, Poeticus and its varieties, and Gracilis among singles; and Double Roman, Albus plenus odoratus (Gardenia Narcissus) and Double Jonquil among doubles. For early-cut flowers Dubius is one of the best grown. To grow Narcissus successfully it is desirable to leave them in the ground for several years—in fact, the first season after being transplanted they do not as a rule flower freely. For pot culture and forcing no bulbs can be more suitable. The Tazetta section, Daffodils, Hoop Petticoats, and Incomparabilis and its varieties, are held in high repute for this purpose; but nearly all are quite as suitable. Pot-grown flowers are so much more perfect in form and size that generally they are scarcely recognisable. Three good bulbs in a six-inch or six in an eight-inch pot would be most effective. If the sorts are such as produce small bulbs a greater number may be put in. Great numbers are grown singly in four-inch pots; they can also be grown in moss or in water, similar to Hyacinths, and with less trouble.

Symbol of all that is fair, pure, and sweet, the Lily (Lilium) may well be termed the queen of flowers. Superbly handsome, gorgeous, beautiful, and grand, rich and varied in color, of stately habit, and deliciously fragrant, they stand out most prominent among the generality of bulbs. Although a great number of Lilies do fairly well in our gardens they require more attention and cultivation than many other bulbs, and extremely hot days discolor the blooms. They have, therefore, not been grown so extensively as they deserve to be.

For richness and brilliancy of color the Tulip is unsurpassed, and about 200 to 250 years ago it was the most popular bulb grown; in fact, the Tulipomania ran to such excess that hundreds of pounds were occasionally paid for single bulbs of special merit, and many families who were smitten with the fever were ruined. Even during the past century as much as £300 has been paid for a single bulb; but these fancy prices have vanished, and good flowering bulbs can be had now at prices that bring them within the reach of all. They are hardy, and require but little attention other than mere preparing the ground, which should be of a light nature. Planted in ribbons, lines, beds, or groups, nothing can excel their gorgeous appearance, consisting of all shades and mixtures of colors in violet, crimson, scarlet, rose, pink, cerise, yellow, and white. The time of planting is from February to April.

The Iris (Fleur de Lis of the French).—Of unique appearance, almost rivalling the Orchids in their gorgeous colors, few flowers are more showy or pleasing. Indigenous to various parts of Europe, Asia, and Africa, this family is a large one, the most popular species being the English, Spanish, and German, although Kæmpferi (comparatively new)is the largest, and possibly the most handsome, growing to the height of 3 ft., with flowers 5 to 7 in. across. Susiana, growing to the height of 2 ft., and producing flowers of immense size, greyish blue, netted and veined with dark chestnut, is most noble and striking. Pavonia (the Vieusseuxia, or Peacock Iris), white, with a bright blue spot on each petal, is exceedingly pretty and novel, and charmingly effective in bouquets, vases, &c.: well worthy of a place in every garden.

But to describe all the different genera with even a short description is beyond the space of an ordinary paper. I will, therefore, simply refer to those best suited for general purposes.

Agapanthus (the Blue African Lily).—A noble plant, suitable for the conservatory or open border, producing magnificent trusses of beautiful blue blooms, rising to the height of from 2 to 3 ft.; when in bloom is one of the most conspicuous objects in the garden. There are many varieties, sports generally from Umbellatus, but, excepting the double, they are mostly of the normal type, the chief difference being in the color. The white variety is very elegant, and held in high esteem.

Some of the Alliums are most beautiful, and deserve a place in our borders, but the strong smell of garlic possessed by the flowers of some of the species is greatly against them for use as cuts. Neapolitanum is a notable exception, being pure white, and almost scentless. It is used in immense quantities for bouquets and decorative purposes, millions of bulbs being imported into England annually from Italy.

The Amaryllis (derived from a Greek word signifying splendor) includes some of the most richly beautiful of all plants. The family is large, and contains superb specimens. They are easily grown, but many of them are better suited for pot culture than the open border. Some of the most desirable are:

Belladonna, with its fragrant silvery rose flowers; produced in autumn, when ordinary flowers are scarce.
Ciliaris (Buphane — Venus' Lily).—Orange.
Falcata (Ammocharis).—Rose.
Gigantea (Brunsvigia Josephine), the Candelabra flower.—Crimson.
Incarnata (Coburghia).—Orange red.
Purpurea (Vallotta or Scarborough Lily).—Deep blood red.
Purpurea Major.—Similar to above, but a little larger.
Formosissima (Sprekelia).—Dark scarlet.

Although expensive bulbs, they make a grand display, and are well worthy of cultivation.

Anemones are a highly ornamental class of easily cultivated tubers, of dwarf habit, foliage elegant, and flowers large, of nearly all shades of color; will grow in any ordinary soil, but well repay a little extra care in cultivation. If planted in succession, may be had in bloom for a long time. Well suited for ribbons or beds. Those most grown are the double forms of Coronaria, and a good bed of assorted varieties when in full bloom is a sight not to be forgotten.

A. chrysanthemiflora (Giant French) is of robust growth and very attractive.

A. fulgens and its double form are a great acquisition, being of a brilliant crimson.

A. Hortensis (Star Anemone of France), of which there are many varieties, is also very beautiful, and admirably adapted for pot culture as well as the open border.

A. Japonica and its varieties, alba and alba elegans, excel all others for grand display, established clumps bearing many branching spikes 3 to 4 ft. high, of crimson, rose, or pure white flowers. For cuts and decorative purposes they are scarcely to be equalled.

Antholizas, Bobartias, Bulbocodiums, Callas, Cyclamens, and Dahlias are too well known to need description; but I cannot pass over the

Freesias, of which there are several species, all more or less sweet scented. The best if Refracta odorata alba, one of the most charming gems of recent introduction, perfectly hardy, is suitable for flower borders or forcing, of dwarf habit, and very floriferous, producing a spike of pure white flowers about a foot in height, most deliciously fragrant. For cut flowers it cannot be excelled, and may be had in bloom from June to August.

The Hæmanthus, or Blood Flowers, are of most unique appearance, although curious, are most showy, and when in bloom no flowers are more striking, the colors being most brilliant—generally red, scarlet, crimson, or orange, shaded, mottled, or splashed. Bulbs very large, but of dwarf habit.

Ixias are pretty Cape bulbs, of most graceful habit, splendid for borders, most useful for cut flowers, and perfectly hardy; always a favorite; but the Ixias of the present time are vastly different to those of a few years since. No flower has more improved under the skilful management of the florist, and many of the varieties now offered rival the Gladiolus in general effect. They increase rapidly, but may remain in the ground for years; no soil or situation comes amiss to them.

Lachenalias also, with one exception, are Cape bulbs, producing numerous tubular flowers, thickly set on a stout flower stalk from six inches to one foot in height. A few are self-colored, but most of them are of several colors, the most common being mixtures of scarlet, red, yellow, white, pink, and green. Good for borders or forcing.

The Leucojum or Snowflake is almost too well known here to need description. No bulb is hardier than this, and for choice flowers for button-hole, bridal, or exhibition bouquets no flower is more useful. It is pure white, tipped on each petal with a green spot; is of most elegant and chaste appearance, and should be grown by every one. These bulbs do best when left in the ground undisturbed for a number of years.

The Muscari (Feather, Grape, and Musk Hyacinths) have been grown in England for upwards of 300 years, and are well worth growing here, being interesting border plants of easy culture, well suited for ribbons or masses. The racemes of the Grape and Musk are very dense and compact, and of lovely shades of color. The Feather is curiously tufted and frizzled, most unique in character, and very striking.

Nerines are well known popular plants, of easy culture, and fragrant. Sarniensis, the so-called Guernsey Lily, one of the best, is a native of the Cape. It got its popular name from the fact of a Cape ship partly freighted with the bulbs being wrecked on the Guernsey coast, the bulbs floating ashore found a genial home on the sandy coast, thus laying the foundation of what has become a most important trade—the growth of the bulbs for the English market. Color, violet red. Corusca produces large clusters of scarlet flowers.

Ornothogulum, or Star of Bethlehem.—This genus contains many species of considerable merit, are hardy, early flowering, and showy. The best probably are Umbellatum pyramidal and Arabicum. The latter, known as the great-flowered, is one of the largest and most striking. Flower stems eighteen inches to two feet high. Flowers large and set on the stem with long pedicles, color, white, with black centre; most useful for bouquets and decorative purposes, as the flowers open in succession for a considerable time.

Pancritiums and Ismenes form one of the most beautiful and distinct divisions of the Amaryllids. Mostly white, occasionally marked with a delicate emerald green stripe, and very fragrant, produced in trusses of from two to seven flowers on a stem rising to the height of from one foot to eighteen inches; admirably adapted for wreaths, centres of bouquets, and the decoration of vases. Similar in appearance to the Eucharis, many of them almost equal to it in size and purity. Of easy culture, but flowers require protection from wind and sun.

The Polianthes (Tuberose) with its tall spikes and sweet perfume cannot be overlooked. It is only of late years this plant has attained its great popularity. In the hill districts, or for greenhouse, frame, or shadehouse, it is a treasure, but is scarcely suitable for open border on the plains, unless it is in protected situations and well supplied with water. For cut flowers it is most useful, as like the Gladiolus the smallest buds will open in water after the spikes are cut.

Although the Ranunculi furnish some notorious and troublesome weeds, almost rivalling the couch grass in rapidity of multiplication and the tenacity with which they hold their possessions, among dwarf flowers some of the species are unrivalled for their lovely form and brilliant and attractive colors, being generally of various shades of white, crimson, yellow, purple, and almost black, about two or three inches in diameter, and as double as the finest Rose or Camellia, each plant supplying from ten to fifteen blooms. When planted in masses the effect is superb. As cut flowers they are more useful even than the Rose, and will keep in water for a week or a fortnight after they are cut. The Persian and Scotch are generally of dwarf habit, from six to 12 inches, mostly imbricated, very double, and in great variety of colors—striped, edged, splashed, or brilliant selfs, whereas the French and Turban are distinguished for their great size, strength, and beauty, averaging 12 to 18 inches in height, generally Pœony, flowered, and are less variegated or splashed than the former. Any garden soil of average quality will suit them, and with little attntion, will continue in bloom for two months. If the colors are nicely blended in planting they make a most gorgeous display. Properly harvested bulbs will keep a great length of time, and may be planted so as to come in succession for at least four months, especially if the late plantings get a fair supply of water.

Scilla (Squills).—No garden can be complete without these lovely flowers; ranging in color from blue, rose, and flesh color to white, can be had in immense variety. Most effective in borders, and extremely useful for cut flowers, lasting a long time in water; generally dwarf, from 4 to 9 in. high; but Peruvian and Peruviana alba (known as the Peruvian Hyacinths) are noble flowers, growing to the height of two feet, producing large corymbs of splendid flowers most useful for decorative purposes. Campanulata also grows tall, and is very robust.

Sparaxis, Tritonias, and Babianas are showy dwarf Cape bulbs of the easiest culture, hardy, and floriferous, most useful for borders or growing among shrubs, occupy but little room, and should be in every garden.

The Sternbergia (sometimes called the Australian Crocus) is a native of Palestine, of a rich golden yellow, is one of the most charming and useful of autumn flowering bulbs. "The flowers rise to the height of six inches above the ground, and the leaves, which are produced in considerable numbers, and so rapidly that the former stand up like golden cups on a verdant cushion." It is perfectly hardy in any ordinary situation, and well adapted for borders and pot culture.

Triteleias, equally at home in pots or in the border, are of the dwarfest habit, and most floriferous; admirably adapted for small beds or ribbons. Their pretty round flowers—white, blue, or the colors suffused—have a most delicate appearance. Alliacea is commonly known as Leucoryne.

These few remarks, I feel, are very imperfect, but possibly they may lead to some little increased interest in this most valuable and popular class of plants (the more valuable because so suited to our climate), and are only intended as a slight help to those unacquainted with the subject.

In conclusion I would call attention to two great fallacies that appear to be widespread. Many persons are afraid to cut the flowers of bulbs, fearing lest they weaken the plants. With very few exceptions cutting the flowers strengthen the bulb, and the practice is common with professional men, when the bulbs are weakly, to cut off the flower-stalk almost as soon as it appears for the purpose of strengthening them; but the practice of cutting away the leaves (as is often done) immediately the bulb has finished blooming cannot be too strongly condemned, as it is most enervating and injurious, and unmistakably shows a great lack of knowledge of the nature and life history of bulbs, for it is through the leaves the plant is recruiting its strength and accumulating energy for the next year's work.

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Pentstemons.

This is one of the most useful and showy of hardy perennials, and it is a plant that has been improved considerably of late years, after a long period of neglect. To the cottage gardener this flower should receive attention, as it is a profuse bloomer, a graceful plant, with a fresh green foliage, and requiring little cultivation.

It was introduced as a garden flower from North America, the chief production of varieties coming from California and Mexico. The name is aptly appropriate and distinctive in description, being derived from pente, "five," and stemon, "a stamen," having four fertile and one abortive stamens. Unlike the great bulk of other flowers, it has no generally adopted nickname, which fact places it somewhat in the standard of aristocrats amongst the common garden flowers. Until it came particularly under the notice of nurserymen as a plant worth cultivating the chief form of growth was of a shrubby habit, with flowers of a somewhat dull crimson purple color. The originals were the parents of a number of seedlings carefully developed into many shades of color from deep purple and crimson to an almost pure white. With attentive cultivation year after year new varieties succeeded each other, until they now possess an established and vigorous habit of growth, producing bold trusses of flowers, many of them singularly delicate in their tints.

Propagation is very easy, either by seeds or cuttings. Any cottager can raise seedlings with only the rudest conveniences. First, care must be taken, as, indeed, is the case with all varieties of flowers, to secure reliable seeds. Put some good sandy loam in pots, shallow boxes, or pans, sow the seeds thinly, and if kept watered and shaded from the strong sun they will soon grow. Those who make a practice of growing new varieties sow their seed in heat, and when the seedlings are ready to be moved are potted off either singly or three or four planted around the sides of a pot, and when grown into sufficient size removed into a well-prepared bed. If heat is not available the slower process of a cold frame can be used, and after planting out showery weather will keep them going until the winter nurses them through the early spring, when a vigorous growth quickly sets the plant up for early blooming.

Pentstemons.

When a good strain has been procured the plants can be increased by a division of roots or by cuttings, set out in a good sandy loam, manured from the cowyard, and leaf soil also added. The most general, and for ordinary purposes, the most successful, method is to take cuttings at this season of young growths from the main stems, and place in a well-drained sandy soil. If kept in a cold frame they will soon root, and become established. We append a list of varieties recommended:

Alba: Pure white.

Bertha Koch: Delicate pink, white.

Emblem: Rosy scarlet, white throat.

Clara: White, bordered with purple.

Alighiere: Dark purple, white throat.

Crater: Dark reddish amaranth color, throat-veined with reddish crimson.

Diana: Dark rosy violet, throat veined with purple.

Gaulois: Dark rose color.

G. D. Siesmayer: Bright red, white throat, veined with purple.

George Sands: Large open flower, veined white lips, tube bright purple.

Kanun: Reddish scarlet.

Laura: Rosy lilac, pure white throat.

Jules Simon: Blue lavender, white throat.

Neron: Purplish, white throat.

M. Chalbert: Clear rosy pink, pure white throat

Miss Hope: Pure white, shaded with rose.

Oracle: Rosy salmon, white throat, pencilled with crimson.

Sculpteur Bartholdi: Clear carmine, white throat.

Tully: Purple, white throat, veined dark purple.

White Beauty: Pure ivory white, tinted rose.

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FLOWERS OF THE CAPE OF GOOD HOPE.

The British colony of the Cape of Good Hope at the south of the "Dark Continent" has been famous for its wealth of flowers from its earliest discovery, and especially is it noted for bulbous plants. There are few countries in the world where in so limited an area flora has so lavishly scattered her treasures broadcast. Not all the districts, however, are so highly favored, for some are almost wholly destitute of flowers or trees. Dreary, waterless plains, with nothing but sparse, coarse grass and low scrub extending over large tracts, depressing to horse and rider, are but too often met with. The advent of the "Iron Horse," brought in by the pressing need of better transit than the old lumbering twelve-ox wagons to transport the hordes that flocked to the diamond and gold mines, has not been an unmitigated blessing, here as elsewhere, especially to the botanist. Vast tracts of well-wooded land have been laid bare that formerly in their seclusion abounded in game, both furred and feathered, and were ablaze with floral loveliness. Early in the sixteenth century, when under Dutch rule, numbers of beautiful bulbs were sent to Holland. The naturalists who accompanied Captain Cook when they touched at the Cape were struck with the vast botanical riches of the place. In consequence of their reports Francis Masson was sent from Kew Gardens in 1771, and he made large collections, which brought Cape flowers into notice both in Europe and America.

In the place of daisies are numerous species of Arctotis, Calendula, Tagetes, Gazania, and other compositæ. One of the trailing Tagetes is known here as Cape marigold, with its bright yellow flowers and whitish foliage presents a type of the flowers of most of the genus, only the others stand erect often 2 ft. high. The stems of the Arctotis are fleshy and sweet to the taste, and children chew them. Close to these flowers grow many species of Oxalis, red, pink, and yellow, the wood sorrels. Some are shrubby, others low on the ground; a few have esculent roots.

Towards Christmas, Everlastings abound. Purple and yellow Xeranthemums, Helipterums, and others are gathered by armfuls for house decoration, and pretty pink and white Gnaphaliums grow in every rocky cleft. As you are slowly walking along collecting your treasures you are suddenly arrested, for the air is filled with fragrance from some unseen source, which soon is discovered to be the white flowers of the climbing Asparagus. Yards of it are taken home to enwreath the pictures, though it is difficult to realise it is Christmas Day, when the sun shines brilliantly and the thermometer is in the nineties.

Yana, Albany, Cape Colony.

THE BALLARAT GARDENS, VICTORIA.

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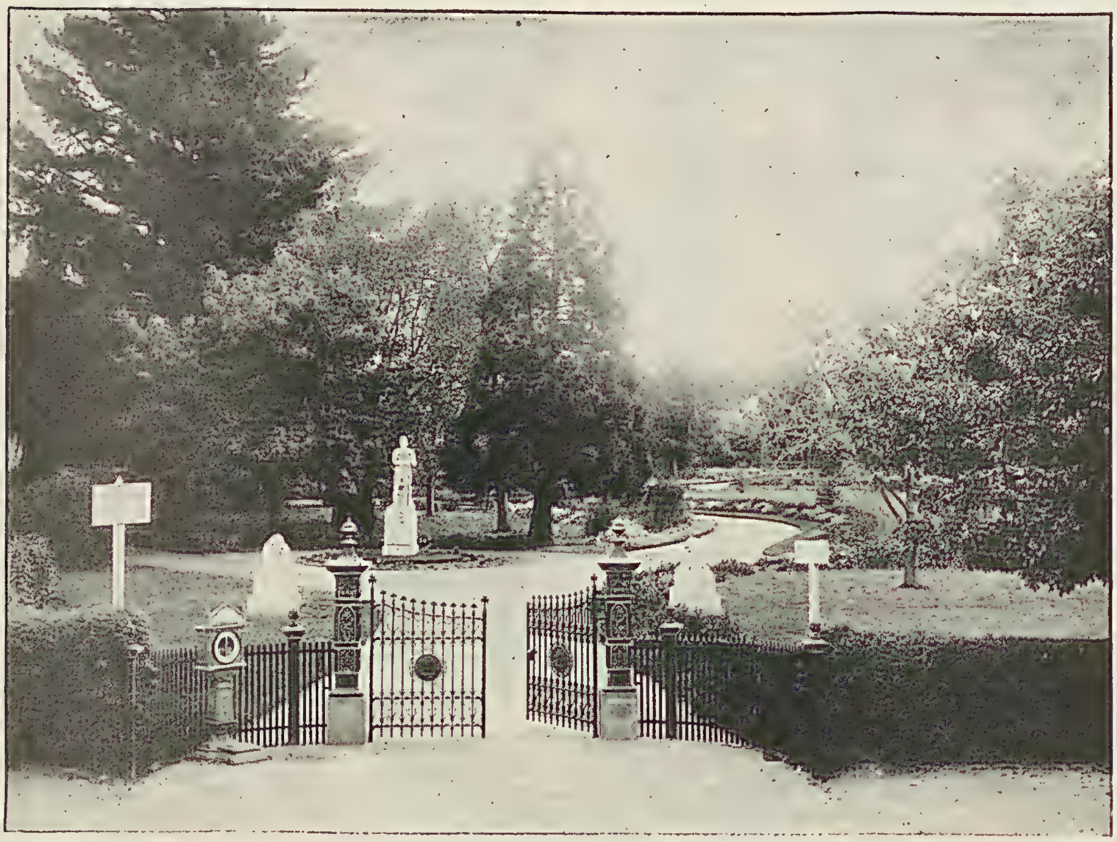

Photo. by Ninnis] [Ballarat.

Front Entrance.

The town of Ballarat, in Victoria, is one of the many surprises that the globe trotter meets with in a new country like Australia. Being built upon golden foundations there need be little surprise that a city of considerable proportions and beauty should rise in the course of but comparatively few years to all the dignity that wealth can bestow. The city is famous for several things. The mines come first, of course, and its manufactures. But our interest lies in the beauty of its surroundings. The laying out of the city with ornamental trees and embellishment by statuary, are topics of controversy amongst landscape gardeners and artists. We have no intention of entering upon this controversy, interesting as it may be, but we are introducing our readers to the public gardens as a beauty spot, not merely worth visiting for a pleasant perambulation, but where many hours of interest and instruction may be spent, amongst the floral beauties, the splendid landscapes, and the giant forest trees.

The gardens, which were formerly the site of the police paddock, were laid out 45 years ago by the late Mr. G. Longley, who served his apprenticeship at Lowther Castle, in the North of England. So well and truly and artistically was his initial work done, and so faithfully carried on that he made the gardens the source of his delight for 41 years. They are now divided into two sections, northern and southern, managed respectively by Mr. Lingham and Mr. Rooney. During the summer months they grow an enormous quantity of flowers, and the gardens from end to end are one blaze of rich colourings, beautifully and artistically blended Gorgeous as the summer blooming may be, the autumn vies successfully in beauty with it. The deciduous trees with their autumn tints contrasted with the prevailing shades of green are the artist's delight.

That the people appreciate all this splendour of nature's charm is evidenced in the fact that during the season some 30,000 picnickers visit the gardens, and it is a rare thing, here as elsewhere in public gardens, for children to thoughtlessly destroy, or for their elders to disfigure the beauties. What more touching sight appeals to those of mature years than to see the innocent little tots of children smelling the flowers, handling them caressingly, and giving expression to their delight by inarticulate words. The park lands adjacent, between the gardens and lake, and on the north and south, are spacious and well sheltered. Here are provided swings, swingboats, roundabouts, and such like provisions for the happy children, and the City Council provides hot water for the luncheon parties. There are two large pavilions at present, and the City Council in their fatherly wisdom are arranging to erect two more.

The first picture is of the entrance to the gardens from the Park frontage. The handsome iron gates were a gift to the city by the Hon. E. Morey, M.L.C. Passing through these the pathway is guarded by two magnificent lions of marble, presented by the Hon D. Ham, M.L.C. These representations of the king of the forest, are fitting attributes to the beauty of the clump of forest trees immediately on the left. Here the statue of "Wallace," a part of the Russel Thompson bequest, is overshadowed by a great specimen of Pinus insignis, from California, as its synonym, Pinus Californica implies. Near by is Grevillea robusta, or silky oak, so well and favourably known all over Australia, a native of New South Wales and Queensland. In the group is a fine specimen of Sequoia, or, more familiarly, the Wellingtonia gigantea, named in honour of the Duke of Wellington. This conifer also comes from California. An Oriental plane (Platanus Occidentalis) named from its broad (platys) head, is also there, hailing from North America. These plane trees have become very popular for planting in public gardens, being most suitable for their shade in this sunny country. Few trees are more handsome. An English Ash completes the group. On the right side of the footpath is seen a lawn with trees of various orders, and bordering of 300 ft. in length, planted with "Salvia bonfire," relieved in the front with Phlox Drummondii compacta. On the left the prevailing beauty is mixed varieties of Phlox Drummondii, and what could look more charming. The footpaths are asphalted, and this is a pity from an artistic point of view, however well it may serve for practical purposes in keeping the garden clean and tidy in appearance with a minimum of labour. But its artificial appearance spoils the general effect of the borders, when compared with the neat and more natural looking gravel footways.

The second picture gives full prominence to the Statuary Pavilion. The view is taken from the north in early autumn, with the statue of "Flora" in the foreground. The borders are planted with scarlet Phlox Drummondii, Pansies, and dwarf Chrysanthemums. The small circular beds are of double white Petunias and double pink Geraniums. In the middle distance on the left is a bed of very fine Cactus Dahlia, growing luxuriantly and throwing some lovely blooms. English Ash and Pinus Insignis, and others mentioned in the first picture complete the surroundings.

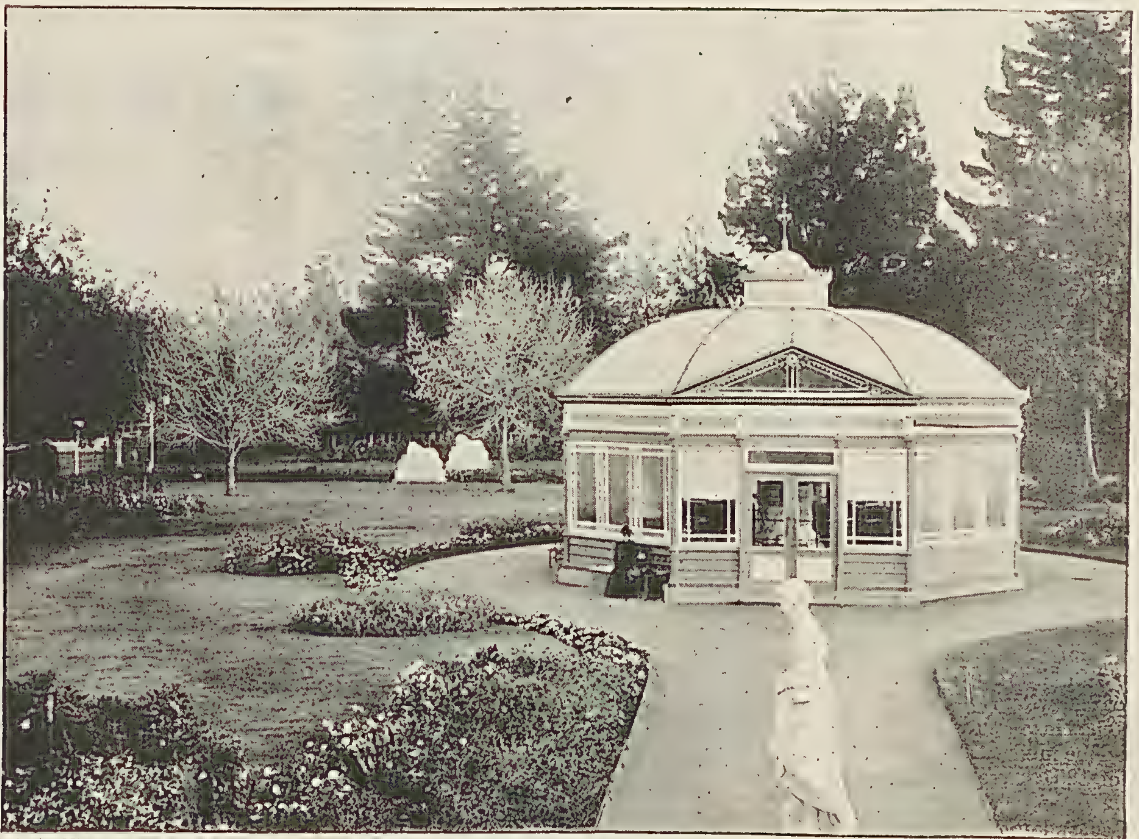

Photo. by Ninnis]

Statuary Pavilion, Ballarat Gardens.

[Ballarat.

Crimson Rambler Rose in an Open Situation.

A good deal for and against this position has lately been written in the pages of "The Gardener." I should like to add my small testimony as to its adaptability to the most open and airy positions. Far and away the best Ramblers I ever saw were growing on open palings exposed to all the winds from the seacoast, in a bleak and high position. It seems to me that such a sight as were these Roses is proof sufficient, and south walls and other protected and warm situations may well be reserved for Roses that require coddling.

—"The Gardener."

The Care of Plants in Frames.

Calceolarias and other subjects wintering under the shelter of a frame may be given air for some hours a day during all mild spells of weather. Dampness is as great an enemy as frost, and is generally due to insufficient ventilation. Such subjects as Calceolarias are so nearly hardy that one need not be afraid of ordinary weather for them at any time when the thermometer is above freezing. It is the greatest mistake to make tender that which Nature has endowed with hardiness, and I could not help feeling sorry for a hundred or so of these cuttings that I noticed the other day in a greenhouse with a temperature of 65 deg. A cold frame would have been far better for them.—"The Gardener."

On the Fertility of Seeds.

(From "Die Gartenwelt," December 27, 1902.)

The "Cologne Gazette," No. 790, contains a statement that wheat has been successfully grown from seed 200 years old. Ch. des Mulins reports a similar occurrence.

According to a report from Jouannet, there are old brick graves in the parish of La Monjie St. Martin, in the Department of Dordogne. Under the stone on which the head of the corpse rested was found a hollow containing grains of seed, from which blossoms of cornflower, heliotrope, and clover were obtained.

In England, too, similar discoveries were made. A small, hermetically sealed earthenware coffin, found in a tomb (apparently of the middle of the twelfth century), at Wymondham Abbey, contained seeds of Columbine (Spornblume), together with common salt and sweet-smelling wood shavings. The seed produced blossoming plants.

In the year 1834 raspberry seeds were obtained from another English tomb about 2,000 years old. Two years later these seeds produced fruit-bearing plants.

For some time past we have heard of the discovery of wheat in the Egyptian mummy graves, which is sold by the finders—usually Englishmen—at a high price. From this the so-called "Mummy wheat" is grown.

All these alleged discoveries may be founded on fact, but they must be disputed.

Nobbe-Tharant investigated seeds of different species taken from a Herbarium made during the years 1574-1576. These still retained some of their natural color. There was not one fertile seed.

Experiments made with a great variety of seeds taken from a large educational collection, which had been shown at the London Exhibition of 1851, gave the same result.

A collection of seeds kept in hermetically sealed glass bottles remained fertile after seventeen years.

Nobbe further investigated experimental seeds which had been sent to his "Society for Experimental Cultivation" by the Berlin Acclimatization Society in 1862.

In 1873 experiments on these seeds, both in a germinating apparatus and in the ground, showed that of 72 species 50 were quite dead; of ten kinds of wheat only one remained fertile, and that only to a slight extent.

Of the rest 50 per cent. (chicory, spurge, tomato, rape, a few kinds of peas and one kind of bean) had retained their germinating power.

It would take too long to describe all the experiments made with collections of seeds taken from old harvest wreaths, &c. All had a negative result.

The greatest interest is excited just now by the careful researches of F. Haberland, which will soon be made public. This reliable experimenter has for many years been collecting seeds of wheat. Some seed he keeps in air-dried places, some artificially dried at a temperature of 120 to 140 deg. Fahr. he keeps in well-corked and sealed flasks in a dry place.

It has been clearly shown that the seeds of wheat, rye, barley, oats, and maize lose a considerable amount of their germinating power even in a few years. Seeds kept in the ordinary way have completely lost their germinating power at the end of five years, while seeds kept in air-dried places lose it after about ten years. Artificially dried seeds can still send up shoots a few years later. These experiments corroborate the conclusions of experience, firstly, that the fertility of seeds diminishes with increased age; and, secondly, that fertility lasts longer the drier the seeds are kept.

The researches of Londet have further shown that the evolution of the germ is slower the older the seed; also that the further development of root, blade, and ear follows the same rule. What a light is now thrown on the short-lived activity of the germ! In the seed is a life essence which must breathe in order to live. It is because of this that the germ is supplied with heat, stuff, force, sugar, &c., by which it is enabled to build itself up and assimilate oxygen, carbon, and water. The germ is able to breathe so long as heat stuff exists in it. When that is exhausted the germ dies.

The substance which is found next the germ is the so-called "meal body" (mehlkörper) of cereals. It will, of course, last hundreds of years in a really dry place. In a damp place, on the contrary, the "meal body" swells, and the reserve nourishment moves towards the germ, so that, later on, when there is no more food for the latter, both the meal body and the germ (which together make up the whole seed) come to grief. If the seed is not exposed to damp, experience shows that the life of the germ ceases after ten to twenty years. There are certain weeds excepted, namely, the oil-bearing Senecio and field and hedge mustard.

R.

CULTIVATION OF THE CINERARIA.

[A paper read at the S.A. Gardeners' Society by Mr. M. Cullen.]

The immense varieties of this flower seem to be the offspring, by various crosses, of Cineraria malvæfolia, acanthifolia, and probably some others.

The comparative ease with which the Cineraria can be well grown, together with the exceeding beauty and variety of its flowers, embracing as is does nearly every conceivable color, with the exception of yellow, will always ensure for it a high position in public favor.

A marked change has been made in the value of this flower since the introduction of the double varieties.

These are so varied in color and beautiful in form that they deserve to take high rank as florist flowers. They are so entirely distinct from the single sorts that even the most enthusiastic lover of single flowers would scarcely venture to institute a comparison between the two as to their value for cut purposes.

Cinerarias are now so generally raised from seed that no other mode of culture need be alluded to. The plant is rapid in growth, very succulent, requires generous feeding, and will not endure extreme heat without suffering.

SOWING THE SEED.

The usual time for sowing is the first week in December. A second sowing may be made the first week in January to ensure a succession of plants.

[Seeds may be sown up to the middle of March.—Ed.]

A compost of equal parts loam and leaf-mould and half part sharp sand will suit it in its early stage of growth. Sow thinly in shallow wide pots known as seed-pans, and slightly cover with fine soil. Water by soaking. Place the pans three-parts of their depth in water until the whole of the soil is soaked. No more water will be required until the seed has germinated. Place the pans in the shady end of a greenhouse or shadehouse, with a pane of glass covering each pan to prevent rapid evaporation. Immediately the seed germinates remove the glass. The result of leaving the glass on, even for a short time after the seed has germinated, is weak spindly plants. Fresh seed will germinate in from four to six days. If the plants have been raised under glass, as soon as well up transfer them to the coolest and shadiest part of the shadehouse. As soon as the seedlings have formed two or three leaves prick them out into the same kind of pots. When the plants have formed a few more leaves transfer them to 3-in. pots in a somewhat richer soil by adding a half part decayed cow manure to the compost recommended for sowing the seed. Endeavor to grow them as nearly hardy as possible. Still it will be necessary to protect them from bright sun.

The Cineraria is a very fast-rooting plant, and it will soon require another shift. It is the custom of some growers to transfer at once to the flowering pots. There is, however, some danger in this practice of over-potting; therefore I would advise one intermediate shift from 3-in. to 5-in. pots. By the time the plants have filled these pots with roots cold nights will have begun to take place, and the most advanced plants will be ready for their final shift. For all ordinary purposes 7-in. pots are large enough, but the 8-in., or even larger pots, are allowable when very fine specimens are required. The soil for the final potting should be of a stronger nature than that used in the earlier stages of growth, and should consist of two parts loam, one part leaf mould, one part well-decayed cow manure, one part sharp sand. To each ordinary barrowful of this compost add a 6-in. potful of dissolved bones (superphospate of lime), which, being more soluble, is quicker in its action than raw bones. Should there be any lumps in the superphosphate these must be broken and well mixed with the compost. Should the soil be dry wet it well while mixing, the whole to be mixed from three to five days before using, to allow the bones to dissolve. When the winter rains set in remove the plants from the shadehouse to the glass frame or greenhouse, to prevent excessive wet. For growers who have not a frame or greenhouse a light verandah is the next best place. While the plants are in the frame give air freely, and on all favorable occasions remove the lights. From the first appearance of the buds manure-water can be given with advantage once or twice a week until the flowers show color, then it should be discontinued. Pure water only should be given during the display.

* * *

Orchard Operations for March.

All fruit that is being stored must be gone over frequently, so that any showing signs of decay may be promptly removed. As the fruits ripen the atmosphere requires to be slightly drier. Apples and pears should not be allowed to ripen on the trees where they are at the mercy of every gale, but should be gathered when perfectly dry, and stored until ripe. The fuller the fruit room the better it must be ventilated. The various fruits soon exhaust the essential properties of the atmosphere, and cannot come to perfection unless a constant supply is kept up.

Summer Pruning.—Continue to thin out the shoots of fruit trees where they are still too crowded to admit the sun, light, and air to perfect next year's growth.

Enable late peaches to ripen quickly by a judicious thinning of crowded shoots and such growth as is unduly screening the fruit.

Water must only be given the trees in sufficient measure to perfect the root and wood growth for next year, and to sustain the leaves until the fall. Excessive dryness is injurious to the trees, as it causes the leaves to sere and fall prematurely. On the other hand, an abundance of water would tend to promote rank, useless growth.

Clear away all fallen fruit to the rubbish heaps, and on no account allow it to rot in the orchard.

All land intended for planting should now be got into readiness for the autumn cultivating. A large stock of manure should be already in reserve for the purpose, and it should be collected at once and got into the right condition for digging in. Land hitherto unreclaimed must be cleared of trees, stumps, bushes, and noxious weeds. Burning is the safest way of getting rid of these nuisances. The ashes are always valuable, and the hot embers sprinkled about will further help to cleanse the area. By all means take this opportunity of making a clean sweep of all impurities; never again will such an excellent one offer itself. A poor, shallow soil should not be chosen for fruit trees, but if it is not a matter of choice it must be enriched and deepened. If a good soil is provided to a depth of from 18 in. to 2 ft. it may be regarded as practically permanent, very considerably simplifying future operations. Grade the land and get it as uniform as possible. The subsoil should be thoroughly broken up, so that it will not remain an inert mass, forming a barrier to the roots, and preventing these from benefiting from the permanent moisture which exists below. Where it is broken up in the first instance the roots when once established will keep it open and provide a free passage for this moisture to pass upwards through the soil. Everything should be done at the outset to encourage a deep root system in this climate.

Plough the soil lightly, so that it may benefit by exposure to the weather until the time arrives for it to have a thorough working in the autumn prior to planting.

Trench deeply all ground intended for strawberry beds, taking care not to bring the clay or heavy subsoil to the top. Enrich the soil with heavy dressings of decomposed manure. Select well-rooted runners. Choose cool, dull weather for this planting, and always endeavor to lift the plants with a good ball of soil. Give the beds a good soaking of water.

Table grapes are plentiful in March, and will be in demand as long as the hot weather continues. All cultural operations should be directed towards hastening the ripening of the fruit, in order that the grower may be able to put them on the market before they pall on the public palate. Keep the soil free from weeds, sweet, warm, and just sufficiently moist to sustain growth. The grapes do not want the fierce rays of the sun to fall directly on them, nor a blistering nor harsh wind to play upon them, toughening the skins. These should be tempered by the surrounding foliage, a mere film, as it were, screening the fruit. Thin the shoots and leaves with this object. Continue to pinch out unnecessary laterals, and firmly secure all growing shoots required for next year.

Gather the grapes when perfectly dry, handling them as little as possible, so as to preserve the bloom. Take care that the appearance of each bunch is not marred by faulty berries.

* * *

In a few years white oranges may grace the American dinner table or the Italian fruit wagon. The New York "Tribune" states that one of the explorers of the Agricultural Department discovered this freak of nature on the shores of the Mediterranean, and took some cuttings to the United States. These were carefully grafted on an ordinary stock at the department grounds, and are now 3 feet high. A couple of years will see the first fruit. If it proves of fine flavour, cuttings will be widely scattered.

MOUNT LOFTY GARDENERS' ASSOCIATION, S A.

The principal interest of the members of this Association, is in floriculture, judging by their annual shows. It may appear a bold remark to make, and the judgment may be at fault in some respect, but travellers who have had the pleasure of visiting these shows, have unreservedly expressed the opinion that no better flowers are grown in the world. The secret of this reputation lies in the perfection of climatic conditions plus the care and knowledge of the gardeners. But these conditions of success are not peculiar to Mt. Lofty, because all over Australia where flowers are grown the same favour is bestowed. Such places in Australia may really be described as the Paradise of the florist. In these localities there are no extremes of heat and cold, wet or drought, so that everything is in favour of the grower to attain perfection. The attention of the members of this Association is, however, not confined to flowers. Fruit of most varieties, but particularly apples, is largely grown, and the markets are supplied from the ranges with splendid vegetables. Since the introduction of the codlin moth, apple orchards have become a byword, and are either allowed to become a wilderness or rooted out. In spite of all that has been done by private enterprise and edicts of the law, the codlin moth has infested the hills to such an extent that apples were written down a failure. That no really combined effort has been made by growers is probably due to the fact that they have other resources that stood them in well from a commercial point of view. Here and there, however, a grower is found who has treated the pest seriously and persisted in combating the evil of the moth pest. Such a one is Mr. Sandow, of Grunthal, who two years ago determined upon arsenical spraying. It would appear that a sound case of apples from his orchard was becoming a difficulty to procure, but on this, his second year of work, he has publicly announced it a perfect success. Not that he has entirely banished his orchard of the codlin moth, for it is still there, but that his trees are now practically free from it and the fruit clean. This announcement was received with incredulity by many growers who had good reason to be sceptical upon the results of their own efforts to combat the evil.

In order to prove to demonstration the results of arsenical spraying the members of the Association journeyed to Mr. Sandow's orchard, and after a careful inspection of the trees, they were abundantly satisfied upon the matter. Only on one variety of Bismarck apple was it noticed that the spraying affected the tree itself. All the others, numbering a great variety, were in no way affected. The object to be attained is to keep the fruit covered with the spray from its first setting as the flower petals fall. The theory is simple enough. It is that the mixture kills the grubs as soon as they are hatched on the fruit. A pear tree was pointed out as an undeniable demonstration of the efficacy of the spray. Last year the tree was not sprayed, the fruit fell to the ground in cart loads and was taken away to feed pigs. This year the tree was sprayed, and at the time of the visit, it was literally covered with fruit, and the fallings on the ground were seen to be not a dozen all told.

At a meeting held under the shade of one of the clean apple trees, Mr. Sandow received the hearty congratulations of the Association, and in returning thanks he volunteered all the information required to attain the same success that was seen there, and patiently answered a perfect storm of questionings. A paper was read by Mr. Robinson upon the results of his efforts at spraying, which we are pleased to print.

NOTES ON SPRAYING FOR 1902 AND 1903.

By W. D. Robinson.

First spray used for the season on October 9, 1902, with Bordeaux mixture, for scab and fusicladium, the trees being in full blossom at the time. Strength of mixture, 6 lb. of bluestone, 6 lb. of fresh lime, made up to 40 gallons of water.

Results of the spraying as above was that the foliage was much better in color and growth, and fruit free from spots. I have been accustomed to using the above when the trees were dormant; but never had such good results as this time. For the future I shall only use the Bordeaux mixture when the trees are active. When the trees are in active growth the pests are also active, and gives the Bordeaux mixture a better chance to clear the pests. Feb. 3, 1903.

Codlin Moth Spray.

Commenced to spray for the moth on Thursday, October 23, using 1 lb. of white arsenic, 2 lb. of soda crystals, boiled to one gallon. One pint of this mixture was put to 40 gallons of water, in which was slaked 8 lb. of lime. It is worth while to mention that in mixing the arsenic I put the pint of arsenic into 8 gallons of milk of lime, containing 8 lb. of lime, and added 32 gallons of water after using Brighton lime, quite fresh, at this time. The pears were just formed and considered ready to spray. The apples were in bloom, so the latter were slightly sprayed all over the foliage and blossom.

Second spray, November 6. The pears grown a good deal; the apples were just right to spray.

Third spray on December 1. This time there had been rather too long an interval. The weather had been unesttled, with rains. The first sign noticed of where the moths had been at work. Some of the Maiden's Blush apples were slightly bored, but the grubs in nineteen cases out of twenty had perished after penetrating the peel. After this spray I had all the trees bandaged—thirty-eight trees in all—ranging from eighteen years to five years old.

Fourth spray on January 2, 1903. The moths show, but few as yet, and the fruit appears to be clean and good, and in every way encouraging. The bandages have been taken off weekly, and as yet have only caught up to date fifteen in all. This is a remarkable contrast to last season's total to date of 175, after which I became disgusted and lost count. It is worth noting that I left four trees with a few apples on each of them unsprayed the first and second sprayings. The variety is Newtown Pippin, and nearly every apple on them is infested with the codlin moth.

Fifth spray on the 24th of January. The apples and pears look well. The Maiden's Blush apples appear to be the most affected by the codlin. The bandages have been inspected weekly, and up to date have yielded sixty grubs. The crop of apples was heavy, and I consider that there was but a small proportion of grubs, in no way compared to the previous year. I am glad to say that the spraying is very encouraging, and I hope to store not less than 85 per cent. of clean fruit.

DUST SPRAYING.

A CONSERVATIVE VIEW OF IT AS COMPARED WITH THE USE OF LIQUID.

"In apple growing districts experiments are being made with dust as compared with liquid spraying. The dust is blown upon the trees by means of an air blast."

In view of this fact "The Rural New Yorker" publishes the opinions of some practical horticulturists on this practice. The secretary of the Missouri Horticultural Society says:

I am slow to say much about "dust spray" because I do not yet feel sure that it is as efficient as the liquid. In fact, it has not been tested long enough to say exactly how valuable it is. Our entomologists and best informed men on fungous diseases give it as their opinion that the "dust spray" is not as efficient as the liquid. But it is applied so much more easily and quickly than the liquid that we can dust the orchard twice or three times with the same expense as one application of the liquid. We can get on the ground when it is so wet that we could not haul a load of water.

The hand dusters are easily handled, and the work can be done after a rain or mist, or while the dew is on early in the morning. We often dust from 4 to 8 a.m., and give the men a half day for the work. Lime (air slaked, fresh) is the base to carry the insecticides and fungicides. I am sure also that lime is good for both these. It is a good insecticide, and it is a good fungicide, and this year we shall test it alone on a forty or eighty acre orchard.

I have used the dust process, first, in a small way three years ago; second, on forty acres two years ago; last year on over 240 acres. This year we shall use it on over 400 acres. I used one pound of paris green to ten pounds of lime; shall use only half that strength this year, as well as lime alone. I used the dry bordeaux for fungicide, one pound to ten pounds of lime. I shall use this year twenty pounds of lime, one pound paris green, one pound bordeaux.

We used five hand dusters and one duster to go in a spring wagon. We dusted three times, and feel sure that it paid us to do so. We were compelled to use something besides liquid, because we had no water handy, and we shall continue to do so in our young orchards. While I cannot say that the dust is as valuable as the liquid, yet I think, from our experience, that we can prevent the insects and fungous diseases if we will follow it up systematically, especially on our young orchards, where these pests have not yet secured a hold. In an old orchard, badly affected with these troubles, I do not think we could check their ravages so quickly or thoroughly.

VEGETABLE GARDEN.

OPERATIONS FOR MARCH.

All vacant land should be prepared during this month for winter and spring crops by a thorough digging, trenching in the case of new land, and heavy dressings of rich manure. This done, the soil should be thrown up that the weather may act upon it, and that it may benefit to the fullest extent from the autumnal showers. Where the soil is moist and can be kept so young plants of cabbage, cauliflowers, and celery can be put out. They should be well watered and mulched after transplanting. To water the little plants previous to removal and to lift with a good ball of earth is the safest way at this season.

The hoe must be kept going continually to check weeds.

Make sowings of carrots, turnips, spinach, radishes, and lettuce during the month. Recent sowings will be ready now for thinning. Attend to this at an early stage.

Young lettuce plants can be planted out in a rich, well-prepared soil, and where they can be kept moist as long as the warm, dry weather continues. Sow fresh seed for succession. Thin out the foliage of tomatoes, and keep the lateral shoots pinched off. As autumn approaches they will want all the sun they can get to hasten their ripening. Keep the soil around them moderately moist. As the tops of potatoes wither they should be dug up and stored in pits or cool, dark cellars. Make a fresh planting of potatoes in a sheltered position.

Towards the end of the month plant bulbs of onions, shallots, &c., and let the soil in which they are placed be thoroughly moist.

Keep up a trim and tidy appearance in the vegetable garden, and remove old haulms and all untidy matter to the rubbish heaps.

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Manager for the Proprietors of "The Australian Gardener,"
61, Brookman's Building,
Grenfell Street, Adelaide.

Shows to Come.

April 30 and May 1—S.A. Horticultural and Floricultural Society. Adelaide Town Hall. Chrysanthemum Show.

April 29—Gawler Chrysanthemum Society. Institute, Gawler.

The Australian Gardener.

WEDNESDAY, APRIL 1, 1903.

EDITORIAL.

The month of April, with its anticipated showers of rain, ushers in the beginning of unwonted activity to the open gardens. Cleaning up and battling with weeds, insects, and fungus pests, manuring and digging it in, planting out seedlings, and a general trimming up are all items of importance during this month.

Now is the time to consult your seedmen's catalogues and pay visits to the nurseries. Any one interested in flowers need never be afraid to seek out a nurseryman and wander with him around his show of garden beauties. He recognises it as part of his business, and a visitor may learn a great deal from a practical man in half an hour spent in such a pleasant fashion. The result will probably be that the visitor may spend a few shillings for some things that will give him the greatest pleasure not merely for the time being, or a day or week or two, but for months, and maybe for years. This not only for himself, but to his family, his friends, and all who pass by his garden. One swallow does not make a summer, but one flower will often make a garden more beautiful than ever it was before.

It is rather surprising that the beauties in floriculture are not more sought after for presents to friends. What form of kindly regard is it possible to give for the expression of feeling than a beautiful flower. The pleasure is doubly enhanced by the efforts of the recipient to cultivate it and show appreciation of the kindly gift. We commend this idea to our readers, and now is an opportune time to make the choice.

A twelvemonth's subscription to "The Australian Gardener" is also a good form of present. Full of pleasant and instructive reading.

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The Flower Garden.

Operations for April.

Now is the time to plan and make any necessary alterations. There are few gardens in which perfect form has been attained, and there are few who fully realise what an important part form plays in the garden landscape, and that the graceful curves and sweeps of lawn and border are as satisfying in a sense as color. Every year should see some improvements made in this respect, another stage reached in the progress towards perfection. Besides effective and harmonious grouping of tree and shrub we undoubtedly want grace of outline—contour; and we want variety. We have had the whole summer in which to scan the garden features in the plentitude of bloom and leafage; we have had the opportunity to observe what it is, and to paint a mental picture of what it should be. Here is a straight line or an ugly angle that wants correcting. In another place perhaps there is monotony of forms; the border wants deepening and throwing out here and there. Yonder the lawn must sweep into the border, and so on until the right effect is produced. Or maybe we crave for change, and would alter the design as we vary the color every year. The garden is plastic in the hands of a skilful designer. He alters a few lines, converts a portion of lawn into border, and border into lawn, and a transformation is effected. We have only to vary our scheme in planting the herbaceous plants and summer annuals to make it still more complete. If a garden is well designed in the first instance with a minority of paths, an absence of angles, and the utmost made of its space there can be no end to the variations of which it is capable. There are few perhaps who have such a craving for variety, but at the same time there is a great advantage in these experiments and continual alterations, for the happiest effects are often obtained by chance. Every day Nature's great garden and our neighbor's gardens have some suggestion to offer us, and if we are not wise enough to register these hints "where every day we turn the leaf to read them," and apply them at the first opportunity, we are no true gardeners.

Now, then, is the time to make our plans and to put them into execution before the autumn rains make the work impossible and cause a delay. Peg out your outlines, and in forming curves the amateur cannot do better than seek the assistance of the garden hose, for, with its supple substance, it readily falls into the graceful curves one has in one's mind. Avoid insignificant turns and twists, let the curves be bold, free, and easy. Aim at broad effects, and avoid petty details. Where a large lawn is to be treated it should not be cut up into numerous little flower beds of elaborate design. Let larger beds occupy the space towards the verge of the lawn, and let these be just sufficiently large and just sufficiently varied to break up what might be a monotony of green. That sward and flower bed may delightfully mingle, and the eye catch glimpses of smooth lawn between and beyond. The beds may be formed in the shape of S's, concave and convex crescents, and similar designs with bold, free curves throwing out an occasional arm far into the sward. But let there be no confusion of lines or undue encroachments on the lawn to destroy the sense of spaciousness, of generous breadth which constitutes its chief charm.

English grass lawns can be prepared and sown this month. The utmost care should be taken in the preparation of the soil. The ground should be deeply trenched, and the subsoil broken up. A good garden loam, not necessarily very rich, but containing a fair proportion of humus, should be supplied to a considerable and equal depth all over. This is most important, for the lawn is one of the first things to show the effects of a dry summer, and if supplied with a sufficient body of soil it is able to hold more moisture in reserve. A perfect level must be provided with the aid of a spirit level and other means, and all holes and hollows that may occur should be filled up with loam. Sow thickly with the best English lawn grass seed procurable, and cover it with a film of light soil Roll the lawn before and after sowing, and at intervals during subsequent growth. It should be kept closely mown, and if this is done frequently the mowings may remain to enrich the soil. Other excellent fertilisers are wood ashes with a little bonedust or superphosphate intermixed, and an occasional top dressing at two yearly intervals of fine compost.

The season for tree and shrub planting being close at hand, the places to receive them should be thoroughly prepared. Where the whole of a bed or border cannot be trenched and the soil renewed a wide, deep hole should be dug for the plant right down into the subsoil. The poorest of the soil should then be thrown out, and a well-prepared soil substituted. It is an excellent plan to fill the bottom of the hole with succulent green stuff from the rubbish heap. This makes a cool, moist bottom of gradually decaying vegetable mould for the plant. This hole can remain open to await the coming of the tree, or can be filled up temporarily, and in any case is ready when the busy planting season arrives.

We advised the sowing of many hardy summer annuals last month. If this has been neglected it should be attended to during the present month. The same remarks with regard to deep cultivation applies equally to these. The greater the depth of humic soil the more independent the plants will be of surface watering in the summer. It is always wise at this season to have a good supply of well-rotted manure on hand for the purpose of digging in and deepening flower borders. Two feet of good soil should be the minimum depth all over the garden.

The garden is gradually assuming an autumnal appearance. Autumn tints are discernable already, and these gorgeous tones will soon compensate for the loss of summer bloom. The wind and heavy rain frequently experienced at this season make it necessary to tie up and stake many plants afresh. Exhausted and dying plants, withered stalks, and all untidy matter should be promptly removed to prevent that bedraggled, unkempt appearance gardens too often present at this time of year. The Anemone Japonica is one of the glories of the autumn. Both the pink and the white varieties are quite hardy, increase rapidly, and are extremely decorative both for indoor and garden purposes. Michaelmas Daisies or the Perennial Aster, besides their soft, nebulous beauty, have also the virtue of flowering profusely at this season. They are best replanted every year after flowering. The roots increase rapidly, and a big root will divide into several plants. Dahlias should still be making a display if the attention we have so often urged has been given them. Chrysanthemum, the autumn queen of flowers, should now be justifying its title. They are always improved, even when only grown for garden decoration, by judicious disbudding. In doing so select the largest and most promising of the terminal buds, and reduce the side buds. Liquid manure, soot water more especially, will intensify the color of the flower and give more tone to the foliage.

As May is a favorable month for planting and transplanting Roses the ground should be thoroughly trenched and drained now for their reception. Cuttings of many hard-wooded trees and shrubs can be taken at this season. Hollyhocks, when they have finished flowering, can be cut down to within 6 in. of the ground. To propagate them the root can be divided or cuttings taken off the basal shoots.

Answers to Correspondents.

"UNLEY PARK."—The specimens you send are Ferrus profanus, adult and nymph form. Regarding them Mr. J. G. O. Tepper, F.L.S., writes: "They are said to injure orange-trees by piercing the young shoots. Have none myself, so cannot speak from experience. Find no damage from them in my garden. Naturally these bugs are predaceous—aphides, scales, caterpillars, even their own kind. Perhaps when unable to get any meat diet they take the vegetable. The chief native bush they frequent is the hedge acacia and its allies.

"ROSE."—Next month will be early enough to make your selection. We shall be pleased to publish a selection.

"AUTUMN QUEEN."—Care should be exercised this month in watering Chrysanthemums. Those in full bloom will need only sufficient to keep the blooms. The bursting buds can take weak liquid manure, while the younger buds will take alternate doses of pure water and liquid manure, while ammonia liquid is also recommended as an alternating stimulant. Two or three days in between each watering, according to the weather.

"Pink."—Strike the cuttings in sand.

"Pests."—If you have not time to protect seedlings from the ravages of slugs it is hardly worth while setting them. We should advise planting out Pinks, Geraniums, Violets, Daisies, well-grown Stocks, Pentstemons, Antirrhiniums, and edging of Echeveria. With these and such like plants you can have a nice-looking front garden with no more trouble than the planting, occasional watering, and weeding. A few shrubs, if you have room, such as Spireas, Choisyas, Salvias, and Lilacs, also Roses in bush, half-standards, and climbers. Ten minutes a day will suffice to keep such a garden worth looking at without fear of destruction by pests.

"Gladiolus."—We will gladly publish differences of opinion, but nothing personal.

"Flowers."—Spring flowering bulbs may still be planted this month, also another sowing of hardy annuals. Divide and replant Phloxes and other herbaceous plants and layerCarnations. Prick off seedlings when large enough into boxes 3 or 4 in. apart. Thin the flower buds of Camellias and Chrysanthemums. Clear out all dead annuals.

"Kitchen."—The main crop of peas, broad beans, onions, and most of the hardy vegetables may be sown this month. Plant shallots, potato, and tree onions, herbs, horseradish, artichokes, cabbage, and cauliflowers, and earth up potatoes and celery as it becomes fully grown.

"The Sparrow" seems to have been as little esteemed by the Egyptians as by ourselves. In hieroglyphics it stood for "smallness, inferiority, vileness, or wickedness."

"Ocimum Viride" is said to drive away mosquitoes. It is used in Africa, of which place it is a native, as a remedy for fever. The plant might be grown here with advantage, for, besides the qualities mentioned, the genus is aromatic, one species, Sweet Basil, being a well-known kitchen herb. The name is derived from the Greek "ozo," to smell.

"Recipe."—When all our daughters have undergone a University course we may expect to see revised cookery books somewhat as follows: Take 1 lb. of the ground seed of Triticum vulgare, ½ lb. crystallised juice of Saccharum offieinarum, 1 lb. desiccated berries of Vitis vinefera, ½ lb. adipose tissue of Bostaurus, 2 oz. saccharated exoderm of Citrus limonum, small portions of Sodium chloride and Sodium bi-carbonate, 2 ova of Gallus bankiva, 1 small radix of Daucus carota, and a little perisperm of Nyristica moschata.

Letters from the States.

New South Wales.

Early last month Mr. Hugh Dixson invited a number of ladies and gentlemen interested in horticulture to his home, "Abergeldie," Summer Hill (Sydney) to inspect a splendid specimen of Grammatophyllum speciosum, the "Queen of Orchids," a very rare variety. The plant is a gigantic one for an orchid, the circumference being 30 ft., and the stems 7 ft. 6 in. long, not counting the leaves. It is in full flower, this being almost the only record of any specimen flowering in Australia. The visitors greatly admired the fine display of flowers in the greenhouses and garden of "Abergeldie," the collection showing to great advantage.

The monthly meeting of the Horticultural Association was held at the Queen's Hall on Friday evening, 6 inst., Mr. A. Hamilton presiding. Some excellent exhibits were tabled, including 24 specimens of cut flowers and 7 shrubs from the Botanic Gardens. The collections of Dahlias, Roses, and Begonias exhibited by Messrs. Longhurst, Holland, Kershaw, and Sullivan were good, and attracted much attention. Mr. C. E. Vessey read a paper on "How Not To Do It," in which he dealt humorously with the mistakes of the amateur gardener in laying out and planting gardens. On the motion of Mr. Tomkins, it was resolved to petition the Government to amend the Vegetation Diseases Act particularly in the direction of fruit pests.

The Drummoyne Horticultural Society held its Autumn Show on Saturday afternoon, 14th inst. Mr. F. Farnell, M.L.A., declared the Show open. There was a good display of cut blooms, pot plants, fruits, and vegetables. The collections of pot plants were very fine, more especially the Bouvardias grown and exhibited by Mr. W. H. Bourne. A feature of the Show was the competition in making and arranging buttonhole bouquets and baskets of flowers by children under the age of fifteen years. These were arranged and made up in the presence of the judges in the hall. The buttonhole bouquet contest was won by Miss Annie Gear (11 years), Miss Amy Atkins (6 years) being second. The basket competition was won by Miss Amy Atkins, Miss Olive Barder being second. During the evening special prizes were presented to Masters Roth and H. Barder for the best-grown fruit-trees by children of members of the society. In the Rose classes the principal prize-winners were: Messrs. G. Knight (who secured the champion award), W. C. McKay, and E. Atkins. Mr. W. H. Bourne was successful in securing the prize for the five champion Bouvardias. The other championship awards were as follows: Four pot plants, Mr. E. Atkins; two light and three dark colored Roses, Mr. E. Atkins. Amongst the other successful exhibitors were: Mr. O. Tarrant, collection of plants; Mr. E. Kerr, collection of Staghorns and Elkhorns; Mr. J. A. Cullip, collection of vegetables; and Mrs. Barder, collection of preserves.

On Saturday evening, 28th February, the Neutral Bay Horticultural Society held its monthly meeting in the Watersleigh Hall, Ben Boyd-road. Notwithstanding the dry season, the exhibition was very creditable. The display of Dahlias, fancy, self, Cactus, and Pom Poms, by Mr. C. W. D. Richardson, was excellent. It was a non-competitive exhibit, and was very highly commended by the judges. Some of the Roses, Carnations, and Bouvardias were first class; in fact, I have not seen better at any of the recent Shows. Miss Peden's exhibits were tastefully arranged, and deservedly gained first prizes: 12 Roses, W. E. Cook, F. N. Camroux; 6 do., W. E. Cook, R. J. Maclean; 3 do., S. H. Robertson and G. W. Colley Priest (equal); champion do., Niphetos, grown by S. H. Robertson; 12 Carnations, J. Stavenhagen; 6 do., F. N. Camroux, J. Stavenhagen; 3 do., R. J. Maclean, T. W. Young; champion do., "Mr. H. J. Pier," grown by F. N. Camroux; 6 cut flowers, J. Knowles, J. T. Ralston; 3 cut flowers, R. Miller, W. E. Cook; arrangement flowers and foliage in stand, Miss Peden, Mrs. R. J. Maclean; arrangement flowers and foliage in basket, Miss Peden; pot plant in flower, S. H. Robertson; pot plant, foliage, S. H. Robertson; fern in pot, S. H. Robertson; hanging basket, T. W. Young; vegetables, A. R. Harrison, J. Knowles. In this section the prevailing opinions of visitors were contrary to the judges'. I am also inclined to think that Mr. Knowles should have been awarded first prize. Cactus Dahlias, A. R. Harrison, F. W. Young; Bouvardias, W. E. Cook, Mrs. R. J. Maclean. An unsuccessful exhibitor in this class, Mr. Knowles, displayed three excellent spikes of "Beauty of New South Wales."

South Australia.

March month in South Australia is looked forward to as one of the hottest, driest, barest, and, generally speaking, most trying to all kinds of life, whether in the animal or vegetable kingdom. This year, however, the month has been the reverse of all this. Indeed, taking the average heat of South Australian summer as a standard, there has been practically no summer at all. Only once has the thermometer ranged as high as 105 deg., and only a few times about the 100 deg. point. Certainly the changeable character of the weather has been somewhat trying to the human system where weak points are available for searching east winds, but there has not been that worn-out feeling that follows the extreme heat of a regular summer. The vegetable kingdom has been all the better for this moderation of summer heat and cool nights, with the result that phenomenal fruit and vintage seasons have ensued.

This was strongly in evidence at the Royal A.H. and F. Society, the Mount Barker A. and H. Society, and the Mount Pleasant A. and H. Society's Shows, all held during March. The Autumn Shows as a rule are not regarded on the plains with anything like the interest that attaches to the Spring Show. But last month the products compared equally with anything that was ever exhibited at a Spring Show. The fruit were as fine as it is possible for fruit to be, while the vegetables were superb. This is not usual at the Adelaide Autumn Show, and the flowers, too, were better than anything for the time of year that we had seen. But here we must put in a plea to the officials on behalf of the flowers. The gardeners do their best, the flowers do their utmost to put their fanciest blooms up for show, then why should not some better effort at arrangement be made. We are quite free to admit that the disposition of the pot plants, seating and promenading arrangements were an improvement on previous years, but the show pots, and cut flowers we are positive could be arranged with greater effect. For instance, a space left between each exhibit would relieve the dense mass of bloom and give the visitors a chance of criticising the judging of the prizes. It often happens that in Carnations there is not much to choose between two or three exhibits, but it is sometimes difficult to discover which have gained honors. It is time, too, that those old wooden boxes to carry the cut flowers were shied out and offered to some juvenile Society, that would be glad to be saved the expense of making them. The flowers are beautiful, and have a right to be shown in all their beauty, which they certainly cannot be when dumped down up to their necks on a straght, flat piece of timber. The Horticultural Society, at their last Show, led the way with one or two Douglas cases, and the Royal should follow suit after seeing the splendid effect attained by exhibiting the flowers in something like their natural habit.

Then again, we would disqualify every exhibit that did not possess a correct name, neatly and visibly shown. If the Show is not to be in some measure educative, and of some value commercially, then we say that if the flowers are merely looked at the object of the Show is largely missed. It is gratifying to look at pretty flowers, but it worth something to know what they are, even if only to satisfy the curiosity of the ignorant. But there is something more in it than that, and the wonder is that the nurserymen, who are the largest prizetakers, do not for their own benefit attach the names to their exhibits. It would surely lead to business. But apart from all that, we contend that it should be recognised as part of the success of the exhibition to have the flowers properly named and displayed.

From a competitive point of view the Show was not exactly disappointing, but we could wish to see a few more competitors. It is a pity that gardeners allow the same competitors year after year to carry off the same prizes. Of course, it is agreed that this does not deteriorate the bloom. If they are worth the prize they get it. True; but if the names of Newman, Smith, Halliday, Giles, and Sewell were taken out of the prize-list, there would be practically no Show at all. This means that these growers take the prizes year after year in endless succession, and there is no inducement to others to come in. It would be unfair and unwise to exclude any gardener from exhibiting, but some arrangement might be made in classifying nursery exhibits, gentlemen's gardeners' exhibits, and amateur exhibits. This might induce a better class of competition.

The Gloxinias were good, but there was no competition, and the same with Begonias, there was only a contest between two exhibits. In view of the fact that there are scores of houses where these beauties can be raised, it seems a little absurd that there should be practically no competition in them. Pelargoniums were little better favored, but nothing to what it should be, and as for the graceful Fuchsia, it seems to have gone out of cultivation. Cannas appear to be settling into popularity, and some fine blooms were shown. An old-time favorite, the Delphinium, seems now to be making for popularity, and we were glad to notice some fine spikes, and Gladioli have come with a rush. There were some fine cuts of these. Dahlias, too, are staying well in popular regard, and notwithstanding the opinion of some leading growers that the Cactus varieties would not last in favor, they were greatly admired for their lovely tints.

At Mount Barker Show the flowers were good, but Messrs. Halliday, Smith, Hawker, and Giles swept up the prize-money. At Mount Pleasant, however, the honors were divided up amongst a greater number of exhibitors.

Taking them altogether the Autumn Shows were very successful.

European Notes.

(From Our Own Correspondent.)

Middleburg, Holland, February 23, 1903.

Middleburg, province Zeeland, under 51 deg. N. lat., has the mildest winter climate of Holland, the lowest mean being yet 34 deg. Of course, many periods of severe weather occupy every winter here, but the thermometer seldom goes as low as 140 Fahr. For twenty-five years only four times a temperature of 90 has occurred, and only once 50 was registered, this being in the very severe winter of 1890-1891, when in Britain, Germany, and France the minimum registered was very much below zero. But very mild winters also occur when vegetation is not stopped at all, and Australian or Cape plants survive in the open.

Of Cape plants only the genus Tritoma is hardy here; Phygelius Capensis is killed every winter to the ground, but springs up every year from the root. Laurus nobilis, Prunus Lauricerasus, Tilanthus glandalosa, (Tree of Heaven) are hardy here. Acacia Melanoscylon is killed to the ground, but the root sends up strong shoots in April.

Of the many thousands of species in my garden I have often tried tender plants to winter in the open, with very curious results. They proved that every species of plant has its own minimum of temperature. The name of the genus does not indicate that all the species of that genus have the same degree of hardiness.

In very mild winters all the Australian plants can be left in the open, especially if planted out. They will gain sufficient strength to stand light frosts, but as we do not know if a winter will be severe or mild this is of little importance to the gardener.

The Californian Giant Tree (Sequoia gigantea) has made fair growth in my garden. I have now a specimen of about five meters in height, with good erect stem. There is another specimen in a garden here measuring fifteen meters.

The first plant flowering this early spring was the green Hellebore (Helleborus viridis), often in mild winters flowering already in December. The winter Aconite (Evanthis hyemalis), the Snowdrop (Galanthus vigralis), and others are now following. But as we now have had about five weeks of very mild weather we are sure to get a very cold March. Many plants are developing their leaves, which, of course, will be ruined if frosts occur.

I have made observations about the first flower opening of several plants in my garden since 1881, and have found a very great difference if one year is compared with another, as the difference in mean temperature between two years is often very great also.

The usual spring drought and very cold weather following in the first half of May hinders very much the sowing of seeds, while the second half of May or the first days of June is too late to get flowering plants the same season. This unfavorable weather we are to expect this year also owing to the permanent south-west and westerly winds, with gales of great force for the latter five weeks, which will be counter-balanced by permanent cold east and north-east winds, with severe frosts next month (March).

The fifteenth International Horticultural Exhibition at Gent (Belgium) of the Societe d'Agriculture et de Botanique will be held from the 18th to 26th April next, and consist of twenty-eight groups, with 620 collections of plants, cut flowers, garden requisites, glasshouses with heating apparatus, &c., &c. The building containing all this will be of enormous dimensions.

Rubus deliciosus (Torr), a North American shrub with very large rose-like flowers, is now much cultivated on account of the latter, with which it is covered in abundance.

CHRYSANTHEMUMS.

Chrysanthemums for Exhibition.

Read before the Montreal Gardeners and Florists' Club by George A. Robinson.

The subject assigned to me this evening is too broad to be covered in one paper, and as the club has decided to hold a show next Fall I will confine myself to remarks on growing specimen plants and cut blooms. If this paper is the means of instilling a larger degree of enthusiasm into the members, and thereby, we get a larger number of exhibitors, I shall feel amply repaid.

Sucessful growers of specimen Chrysanthemum plants commence at exhibition time to prepare for the next year, by noting varieties, with their distinctive qualities, such as color, stocky growth, and size of bloom. Having decided on what varieties to grow, "eternal vigilance" must be the watchword until the prize cards are hanging on your plants.

Cuttings from the base of the stock, rooted in the early part of February, make the best specimen plants.

A common fault is to leave the cuttings in the sand until they make a spindly growth and wiry roots. Nothing more effectually impairs the future constitution of the plant. Just as soon as the cuttings stand up stiff it will be found that roots one-half inch in length are formed. This is the time to pot them, and you will have a clean, thrifty plant that will go right into the new soil and render a good account of itself.

The first potting should be into two-inch pots, using a light soil, placing the young plants in a cool, airy house. Give the plants a two-inch shift as they require it, using a heavier soil at each potting. At the final potting, in June, use good, well-rotted fibrous loam, with a sprinkling of bonemeal, and burned refuse or lime rubbish, to keep the soil open. Use very little manure, as too much humus has a tendency to sour the soil before the roots can make much headway, while the properties of value are exhausted before they can be used. Pot moderately firm, and water sparingly, until the plants get well rooted.

Pinching must be attended to regularly, commencing when the plants are in small pots and four inches high, continuing without intermission until about the end of July. This work must be done systematically, never allowing one shoot to gain strength at the expense of the weaker ones.

After the pinching is stopped the training must be attended to. Don't allow the shoots to get all bunched together, as this means diseased foliage. Give the plants plenty of room; turn them around occasionally to keep them in good shape. Syringe twice a day in bright weather.

A light fumigating, a dusting with tobacco dust, or a syringing with some of the many tobacco extracts will obviate the injury often caused by the ravages of insects.

As soon as the plants are well rooted in the flowering pots, feeding should commence. The larger and stronger the plant the more food it will require. It is far better to underfeed than to overfeed, until the buds are set, as over-feeding at this stage will result in a tall and weak growth. After the buds are set feeding must commence in real earnest and must be persevered in. It is just about this time that the close observer realises what a gross feeder the Chrysanthemum is. This part of the treatment is not the most pleasant thing in the world, but on it depends the final success. Animal manure should be the basis of all fertilisers. Decoctions made from horse, sheep, or cow manure are the safest to use. Hen manure and nightsoil are both excellent fertilisers, but must be used with discretion. Nitrate of soda and sulphate of ammonia in the proportion of one-quarter ounce to one gallon of water is beneficial. A complete change of food each week is much better than mixing several fertilisers together all the time. It is impossible to give the exact proportions of each of these fertilisers. This, and the time to elapse between each feeding, must be left to the discretion of the grower.

An occasional dose of lime water will keep the soil sweet and aid materially in hardening up the shoots. All feeding must cease as soon as the flowers begin to show color.

Disbudding must be attended to as soon as the buds are large enough to handle. This work should be done as much as possible early in the morning while the buds are brittle.

In disbudding, commence at the top of the shoot, and if the top bud gets broken out, one a little lower down will be left to replace it.

Just as soon as the blooms begin to show color the final staking must be done; and at this time the plants will have reached a stage where it is possible to put each bloom in its proper position to make a symmetrical plant.

For exhibition blooms, cuttings rooted the early part of March and flowered in seven or eight-inch pots, with one, two, or three blooms to the plant, are in every way superior to later cuttings flowered in six-inch pots. The blooms in the former may not be any larger, but they will have a better finish.

The cultural decorations given for specimen plants will apply equally for specimen blooms.

A problem in which experts greatly differ is "taking the bud." My opinion is that the early crown buds, with but very few exceptions, should not be taken. August 15 is early enough to take the bud of most varieties, and many will make exhibition flowers if the buds are taken later.

Most of the failures from crown buds are caused by keeping them too cool. A temperature of 50 deg. at night with a rise during the day should be maintained.

With a terminal bud the plants must be kept cool to allow the latest formed wood to ripen. Neglect of this important matter is the cause of most of the trouble with weak-necked flowers.

Some delicate manipulation is required just before the exhibition to have each variety in perfection at the proper time. The best way to retard early blooms is to put the plants into a cool, dry, and darkened room, or cellar. They keep much better in this way than if cut and treated similarly. To force a late bloom is a very difficult matter, and is very often attended with very indifferent success.

There has been a lot of discussion lately upon the varieties known as weak-stemmed for exhibition purposes. I cannot see any objection in supporting a weak-stemmed flower for exhibition purposes. Many of the largest and most graceful reflexed flowers are too heavy to stand erect, and these varieties are the very ones that prove the most attractive at the exhibitions. The elimination of these varieties from flower shows is having its effect on the American raiser, and while varieties such as the white and yellow Major Bonnaffon, Pennsylvania, Ivory, &c., are disseminated in large numbers, the more showy sorts are neglected; consequently, we have to rely on European and Australian raisers for these.

"Variety is the spice of life," and especially the life of a Chrysanthemum exhibition; so let us collect all the large, showy, and odd, as well as the commercial varieties, and have a show to please the public, rather than to suit ourselves.—"Florists' Exchange."

Plants to Carry Twenty or Thirty Blooms.

"I wish to grow a few Chrysanthemums with from twenty to thirty blooms each on a separate stem, and would be glad to know the names of six of the most suitable kinds (different colors) and how to manage them from the time the cuttings are struck.—Yorkshire."

Had you inserted cuttings of the varieties you intend to grow a month earlier you would have enhanced your prospects of success. Still, provided you commence operations without delay, and use some bottom heat to hasten the rooting, you may make up for some of the lost time. The most suitable kinds for your purpose, in different colors, are: Lizzie Adcock, rich yellow; Crimson Source d'Or, orange-crimson; White Quintus, pure white; Pink Selborne, lilac pink; Bronze Soleil d'Octobre, bronzy-fawn; and William Seward, a deep rich crimson. Each of the above-mentioned sorts is of easy culture.

and given proper treatment should make a fine display. When the plants are about 6 in. high take out the point of the growth. Keep the plants rather dry at the roots for a few days to assist in the development of new shoots in the axils of the leaves. From the several new shoots select two or three of the stronger, growing these on, and rub out the weaker ones. Pot on the young plants into larger pots from time to time, using those 9 in. in diameter in which to flower them. Never pot on a plant until it has filled its pot with roots, and never pinch a plant at the same time that it is being repotted. At least a week should elapse between the two operations. After the first stopping, already described in detail, you should pinch out the point of each succeeding 6 in. to 8 in. of growth, giving the final pinching about the third week in June. This must necessarily develop plants of a bushy character. We would advise you to partially disbud your plants, and if you prefer to have flowers of medium size on stiff, erect stems, retain only one bud on each shoot. Throughout the summer and early autumn give the plants a good open sunny position, standing them on boards, slates. tiles, or anything of this kind to prevent the ingress of worms. Insert strong stakes or Bamboo canes for the support of the branching growths, lightly looping these to the stakes with raffia. Do not feed the plants until the flowering pots are well filled with roots. House the plants during the last week in September. Greenfly if present may be eradicated by dusting with tobacco powder.—W. V. T., in "Gardening."

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Chrysanthemum Blooms in Vases

What is wanted at exhibitions in connection with vase classes for cut Chrysanthemums is more of that free-and-easy style of setting up the flowers seen in our own homes. When it is required that so many blooms only be shown in a vase to be judged chiefly as exhibition flowers and without any other foliage, then it is inevitable that the classe or classes will become as monotonous and objectionable as are the board classes. I could but notice in our own show here in Kingston last November, that by far the prettiest vases of blooms were those of amateurs and cottagers, who had not only a free hand as to flowers and arrangements, but also brought their own vases, all being more or less diverse. These were far more pleasing than were the large show bloom classes. It seems to be very evident, judging by what has been written, that the public or amateur taste, so far as Chrysanthemum shows ars concerned, is rebelling against the big or fat flowers in vases, and is asking for something much more pleasing, decorative, and artistic. The fat flower classes are the fond children of those whose highest aim in flower culture is to win good prizes. These exhibitors must be given to understand that such ideas in relation to flowers are becoming repulsive. There is now, in relation to Carnations, a great rebellion against dressing the flowers and showing them with paper collars. The same thing is cropping up in connection with the showing of Roses—still so terribly formal in their boxes. So also with Dahlias, even the beautiful Cactus forms being shown in rigid wire frames in the most unnatural way, so that people are getting tired of seeing them so displayed, and are calling for more natural methods of showing them. But of all flowers none seem naturally better suited for vase display than Chrysanthemums do, as they have long, stiff stems, and can be set up in almost any lengths, thus admitting, especially in conjunction with draping foliage, most pleasing and graceful arrangements. Show committees cannot too readily lend their attention to what the public ask, and cater less for the old stereotyped lumpy blooms which for so long have been the exhibitors' favorites. One unpleasant feature of the big bloom competitions is that the trade make it their business to knock out varieties that have been favorites after a couple of years or so of showing, because old varieties have become plentiful and cheap. That is done by forcing on growers new varieties that can hardly be said now to show advance or diversity on the old ones, and if some will not foolishly purchase them others will. Chrysanthemum showing has been a fine trade bloom, but it has seen its best days, happily. A correspondent, Essex," sneers at market blooms. He is welcome to do so, but his sneer will only help stay the growth of public taste for more beauty and less bigness in Chrysanthemums.—A. Dean, in "Gardening."

* * *

Chrysanthemums Deteriorating.

The haste which in the past has characterised all operations in the culture of exhibition Chrysanthemums is largely responsible for the weakened constitution of many of the varieties, which from time to time have taken a high position at the leading exhibitions. A new variety is in the first season grown to its fullest extent. As most exhibitors know full well, a promising novelty, no matter whether it be a seedling or a plant of a few years' standing, is grown for "all it is worth," in the language of the grower. From the very outset a strain is put upon the energies of the plant, and all through the growing season the same course of treatment is observed. This, being followed by a period of some six to eight weeks' treatment in a glasshouse, often overcrowded with plants, weakens the plant. For some months the plants are highly fed, so that when the time comes round for procuring stock, cuttings of a most undesirable kind are the only ones obtainable. But the feverish haste to commence another season's work, plants grown in the manner just described could be treated in a way to restore, to some extent, at least, their lost constitution. Some of the leading growers plant out stock of the better sorts, but with the novelties they have no chance of doing so. When the few stock plants come into their possession, the Chrysanthemum specialists, to meet the demand for novelties made upon them, put in every cutting, and in the succeeding flowering season growers wonder why the new sorts fail to reach the standard seen during the previous season, and also so faithfully described in the gardening journals. The process of deterioration which begins so early in the life of the plants is continued in the two or three succeeding seasons, and unless the constitution of each one is exceptionally robust and vigorous, the variety, so to speak, goes to the wall. What else can we expect, after giving the plants so severe a system of culture? It is unreasonable to expect anything else than failure, and so long as the present system of early propagation is followed, so long will results be unsatisfactory.

It is not possible for every grower to plant out in his garden a batch of exhibition sorts, and many are not prepared to take that trouble. It cannot be denied, however, that it is a wise course to adopt, and it brings its own reward. If it is not possible to grow stock plants in the open border as suggested, other means, though not so good, may be taken to achieve somewhat similar results. Plants which have been subjected to high culture should, after flowering, be cut down and either have the ball of earth and roots reduced, and be potted up into 6-in. or other smaller pots, using good soil for the purpose, or they should be plunged in soil in frames, or, better still, in soil of a fairly light character on the side benches of the glasshouses. The latter position is the better one, and so long as the plants are not excited into quick growth by a high temperature, the resulting growths, which should develop in the early days of the year and just as the days begin to lengthen, should be all the grower desires. Cuttings from such plants may be put in with the reasonable prospect of producing satisfactory results. Instead of lanky and unsightly plants developing, those of dwarf to medium growth should be the result. These latter, too, are easier to handle, and also retain their foliage much better. I have just seen a batch of plants treated in the manner described, and these are now freely developing growths of a sturdy kind. A January and February propagation is quite early enough for all purposes.—C. H. N., in "Gardening."

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✣ CARNATIONS. ✣

Carnation Gardening at Neutral Bay, Sydney Harbour.

By J. Stavenhagen.

We have heard a great deal about Sydney and its surroundings, coupled, of course, with laudatory comments on "Our Harbour," but even the casual observer must have been struck by the great sameness of foliage, and the remarkable absence of any attempt on anything like a large scale to remedy this great defect. The cause is not far to seek, and it may be summed up in very few words—the want of good soil.

Freestone and sandstone are practically everywhere, and with the exception of a little good soil gathered here and there in a gully the soil available is but more or less barren sand, and any attempt to promote vegetation is naturally accompanied by great expense, as in many instances good soil would have to be brought great distances.

Were it not for this the otherwise extremely favorable position of Sydney Harbor would make it one of the most beautiful spots on the face of the earth.

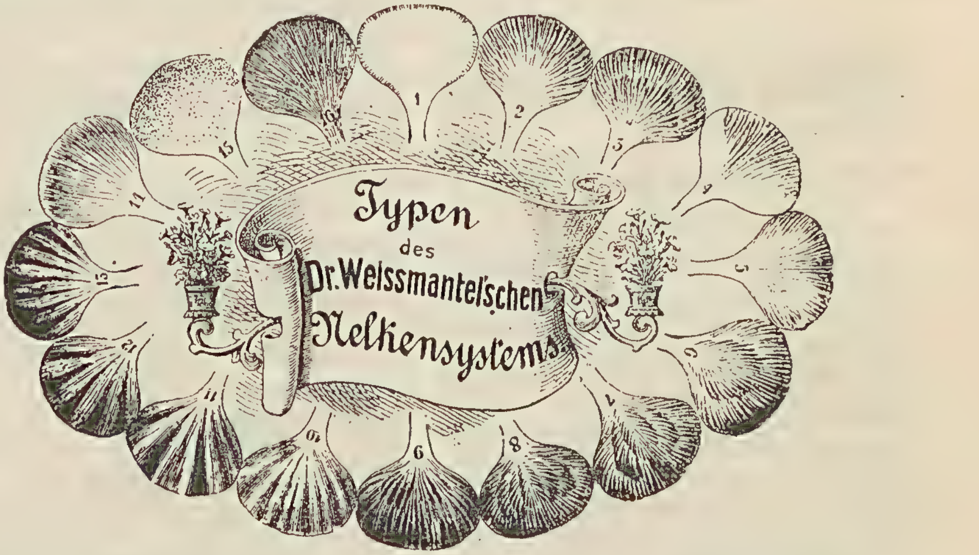
This want of good soil naturally throws any attempt at beautifying upon the individual, and it follows of necessity that when seeking to cultivate his garden the owner will naturally consider what he can grow to the best advantage. Frequently a few miles back from the actual water line of the Harbor there are belts of clay, and the gardener will at once take advantage of such a circumstance to cultivate roses; but it will be freely admitted that the possibilities of cultivating beautiful flowers in sandy soil with the aid of manures is nearly always overlooked.

Annuals of all kinds can be grown in light soil, but of all plants the Carnation demands soil of this character. It is almost impossible to grow the Carnation in stiff soil, or, at any rate, there is no comparison between the success attendant upon the cultivation of this plant in stiff soil as compared with light sandy soil.

Very few flowers repay cultivation better than the Carnation, but, like all flowers that are brought to perfection, they need a certain amount of trouble and care. Often the amateur gardener will take an enormous amount of trouble in his garden, with poor results, simply because his efforts are misdirected. One-tenth of the same amount of energy properly directed would bring its own reward by the ample attainment of the object he is seeking. Without any attempt to use scientific terms or theories, but giving my own experience in such a way as even the most unlearned amateur may grasp my meaning, I will endeavor shortly to explain the methods which I have adopted to cultivate the Carnation under perhaps the most unfavorable conditions possible.

My garden is situated in Neutral Bay, about half a mile from the water's edge. Apart from the intrusion of rocky boulders, which had to be cut up and removed, the soil consisted mainly of ironstone, gravel, and sand, about as hungry and as poor a soil as anybody could attempt to turn into a garden. Laborious sifting left a yellowish sand, very apt to cake after exposure to the sun. Out of this crude material a fairly successful garden has been built up. The one undoubtedly favorable circumstance was the absolutely perfect trenching which took place. Many hundreds of loads of cow manure were used. Whenever it was possible to obtain vegetable matter, such as weeds, &c., these were buried in as large a quantity as it was possible to obtain them. The settling of the ground which took place almost after every shower of rain was made up by digging in cow manure, and when the usual crop of weeds, which cow manure nearly always produces, followed, these, too, were dug in. So much for the soil.

Favorable spots were then chosen for the Carnation beds, which, after frequent forking, became very suitable for the purpose for which they were designed. Young plants were secured from one of the able nurserymen, of whom there are many in Sydney, and it now became the question of rearing these to the best possible advantage. This was done by continually feeding the plants with liquid manure, of which raw cow manure was the body. A large tub, holding about a hundred gallons of water, was used. In this the following preparation was mixed: Four buckets of raw cow manure, one bucket of clay or black soil as procurable, half a bucket of bonedust and blood. Sufficient water added to make the mixture really fluid. Whilst the beds were comparatively new this mixture was used about once a fortnight, then about once a month, care being taken not to go too near to the roots of the young plants, which should be left to forage for themselves. Frequently after a shower of rain in the warm weather a perfect carpet of weeds will be produced. Fork them in while they are but a few inches high; the Carnations will take very kindly to them. With such heavy manuring it is quite possible that the soil may become a little rank, particularly if there are no heavy showers of rain. Many gardeners use lime in the cultivation of Carnations. This may be very well in the naturally rich soil, but with such soil as I am describing I would much prefer to use soot; and for convenience it is just as well to mix the soot in with the preparation. If the plants have been lying dormant for some time, and blooms are wanted for any particular period, an application of this preparation applied five to six weeks beforehand will undoubtedly produce the blooms, renewing the application in milder form as may be deemed advisable. At any rate, this is my experience in the soil referred to, whether or not it will be successful in stiffer soils I am unable to say. Experience will soon prove the quantity of liquid manure which should be used. Should the soil become soured by repeated manuring a little lime will always correct any such condition. Soot can be relied upon as a great deterrent to any fungoid growths.



Types of Dr. Weissmantel's Carnation System.

(Illustration from "Otto Froebel.")

1. Edged Picotee: Short stripes from edge inwards; quite even.
2. Old German Picotee: A succession of short stripes from the edge to the middle of petals.
3. New German Picotee: Stripes as in No. 2; however, reaching further towards the centre, being here and there bent, broken, or prolonged.
4. Pyramidal Picotee: Stripes forming a wedge; most beautiful.

5. Dutch Picotee: A mixture of Nos. 2 and 4.

6. New French Picotee: Edge as in No. 2, but, in addition, there is a series of markings radiating from centre line of petal and touching the edging.

7. New Spanish Picotee: Like No. 6, but with two inner sets of markings.

8. New Italian Picotee. Very rare; like No. 6, but with three inner sets of markings.

9. Torch: Markings of two colors, melting into each other; ground white.

10. German Bizarre: Two or more marking colors running over white petal, into the claw.

11. English Bizarre: Like No. 10, but with broader bands.

12. German Flake: One colored, markings on ground color.

13. English Flake: Like No. 12, but with narrower bands.

14. Flamed: White ground, flamed with one color which does not reach the claw.

15. Salamander: Marking color dotted over whole leaf.

16. Grenoble: One marking color reaching the claw.

With each of the types 6, 7, and 8 is associated an old type, in which the inner markings reach into the claw.

R.

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Selection and Arrangement

OF

Hardy Perennials in the Garden.

The subject of the arrangement of hardy plants in the garden and the selection of varieties which will prove most appropriate in certain locations is one which has so wide a scope that a few notes of suggestion will prove of value to those who hitherto have had little experience with them. A common mistake is made in dotting individual plants in the wrong places, where the effect of their foliage or bloom is to a large extent lost, and it should be the aim of the cultivators to group several plants of one class together rather than to isolate them individually among tall growing varieties, where they will eventually be overgrown and fail to create that favorable impression which otherwise their merits would secure for them. It is a mistake, moreover, to locate hardy plants, which deserve special culture in the ordinary border, where in time they will gradually diminish and be lost sight of. All plants of a delicate or diminutive growth should be planted where they may receive necessary care in cultivation. On general principles it is best in forming a bed of hardy perennials, where it is open on all sides, to group the taller growing varieties in the centre, gradually filling up the foreground with those of dwarfer growth, while the front of the bed towards the edge should be thickly studded with the dwarf plants of creeping or low growing habit, such as Arabis, Daisy, Cerastium, &c. If in connection with the hardy perennials it is deemed desirable to associate some of the more ornamental dwarf shrubs, like Deutzias, Spireas, Choisyas, Swainsonias, Hibiscus—and these evergreen shrubs are especially qualified for this use—then it will be well to use these shrubs towards the centre and sides of the beds, interspersing here and there between them groups of Delphiniums, Solidagoes, Lilies, tall-growing Pyrethrums, Iris, Perennial Phloxes, Asters (perennial), Scabious, Chrysanthemums, Maurice Pritchard (the latter a very handsome, showy variety), Stoksiacyaneus, Libertia formosa, Rudbeckia, and many others which have a growth of from 4 to 5 ft. The growth of the shrubs will to no great extent impoverish the soil provided the beds receive an occasional top-dressing of manure. By falling into the common error of planting hardy perennials in formal lines, dotted at intervals, a large portion of the effect which otherwise might be had is lost. Plants are gregarious in habit, and enjoy the grouping together which has been suggested, and a hundred daffodils brought together in a mass produce an indescribably finer effect than if scattered one by one in open spaces. In the same way all the hardy perennials should be planted in masses according to space at command, filling up, without too much crowding the intervening surface between shrubs and taller varieties. I strongly urge a liberal use of spring blooming bulbs along the edges of all beds of herbaceous plants, such as Scillas, Daffodils, Snowdrops, and many others which may suggest themselves to the taste of individuals. These will be followed in quick succession by a development of blossom, which in a well-arranged bed should afford a constant display until the Japan Anemone, which is about the latest of all the hardy flowers, comes into bloom.

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CRIMSON RAMBLER.

TO THE EDITOR.

Sir—In some of your recent numbers mention has been made of "Crimson Rambler" as an autumn bloomer. I enclose a small truss taken from my Rambler last evening. The plant (now four years old) had not borne flowers since the end of last November until this truss appeared—a solitary one—neither has it before had an autumn bloom. As attempts are being made in France to perpetuate the autumnal blooming form, it would be interesting to know how many of your Australian readers have noticed the autumn blooming, and if any of them have tried to fix the form.

I am, Sir, &c.,

E. LESLIE POOLER.

Stirling West, March 18, 1903.

DELPHINIUMS AND DISEASE.

TO THE EDITOR.

Sir—Many of your readers who are growers of Delphiniums have been troubled by a disease in their plants. We may say that we have always found the Delphinium hybrids more or less subject to this obscure fungoid disease. Dr. Cobb, the Government Pathologist of New South Wales, on being shown a plant thus attacked, stated after careful examination that the fungus was one specially apt to exist in soils where an insufficiency of lime prevailed. In this State, where in most places lime is more or less present in the soils, especially around Adelaide, the disease is not particularly troublesome, not more than 10 per cent. of the plants succumbing to it. The disease more especially attacks those plants which send up a straight, hollow stem without side shoots, and that those which branch at the base readily do not seem to be so attacked. We think that it might be worth while proving whether the inference to be drawn from this is correct, viz., to cut back the first main spike before it gets far advanced, and so cause the basal buds to shoot. Around Sydney the trouble appears to be acute, and we would suggest, in view of the fact that the disease is fungicidal, that powdered bluestone (sulphate of copper) and sifted lime mixed be lightly dusted over the soil and well dug in and mixed when planting the Delphiniums. This is really a dry Bordeaux mixture, the most useful fungicide known, and the most perfect for all general purposes. This might be followed up with a spraying of Bordeaux mixture just as the plants begin to throw a spike, and once or twice later. A disease which has been more trouble than this obscure fungus is the well-known red spider. Soap and tobacco boiled up well and strained is the cheapest and most effective wash. The species of Delphiniums as distinct from the hybrids are almost immune to the fungus that attacks the others, another instance of artificial work, viz., hybrids having to be maintained by artifice.

I am, Sir, &c.,

FRED C. SMITH.

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Ether and chloroform, so useful in sending men to sleep, have the very opposite effect on plants, which are stimulated to the greatest possible activity by these drugs. In Denmark and Germany advantage has been taken of this fact to force flowers in rooms and glasshouses and to make them bloom out of season. The results are said to be marvellous.

A choice collection of eighty-four Carnation plants, grown by Mr James Douglas, of Great Bookham, England, were received by Mr. John Goodwin, of Ashfield, New South Wales, during March.

DAHLIAS.

The Dahlia in America.

[Read by L. A. Martin before the Tarrytown, N.Y., Horticultural Society.]

(From "The Florists' Exchange.")

[Planting operations for Australia begin during September.—Ed.]

This interesting and useful plant for the decoration of our gardens in middle summer and fall was first discovered in its wild state in Mexico, and introduced into Europe about 1789, and although cultivated in several different parts of the country by amateurs and gardeners, it failed to become well-established before 1814, when the first semi-double and double varieties were obtained, and a new impetus given to the cultivation of the plant.

The changes and imvrovements obtained and the popular attention given to the culture of the Dahlia are really wonderful; principally are these advances noticeable in the case of the types of new Cactus and decorative Dahlias. But, however popular those new types may become, I hope they will not supplant our old ball-shaped varieties, with their beautiful colors and symmetrical forms.

What other plants can give us such a diversity of color of every shade and tint? Its ease of cultivation, and its adaptability to several conditions, make it, indeed, a most useful subject, either for the purposes of cut flowers, bedding, bordering, mixing among shrubs, potted plants with the dwarfer varieties, or as a single specimen on the lawn.

CLASSIFICATION.

The varieties of Dahlia have been divided into many different sections and classes. The following will be most generally found mentioned in catalogues:

Show: All varieties producing large, compact, well-formed flowers, usually of a solid color, but sometimes shaded with darker or lighter tints.

Fancy: All variegated varieties.

Cactus: Of recent introduction, and the class most thought of to-day. The flowers are perfectly double, with long narrow petals, and the plants are very profuse bloomers. The variety Juarezii, an intense scarlet, was the first of this type to be introduced in 1872, and consequently is the parent of this extensive class.

Decorative: An intermediate form of the above, and sometimes classed with it. The plants are of strong growth, and produce large flowers with flat and broader petals. One of the best for general decoration.

Pompon: One of the most useful for bedding; also for flowering in pots; of dwarf and compact growth.

Single: Very useful for bouquets; these are among the easiest to grow.

PROPAGATION.

Propagation is effected by seed, cuttings, divisions of the roots and sometimes grafting. The seeds are sown in flats, in the greenhouse, in March. When the seedlings are large enough to handle, transplant them into 2½-in. pots, and set outside after danger from frost is past. If well watered until thoroughly established the plants will flower the first season.

In the case of cuttings, the old roots are placed in a bench, in a greenhouse, the roots being only covered (not the crown), with about 2 in. of soil. Syringe when necessary to keep them partly moist. As soon as the young shoots are about 3 in. in length, tear off, or cut with a knife just below the joint, and place the severed portion in a cutting bench. With proper treatment they will root in about ten or twenty days, when they can be transferred into 3-in. pots, and shaded for a few days. As soon as the roots have taken a good hold, remove the plants to a cold frame. Keep as cold as possible to retard their growth without impairing their vitality, in order to get strong and thrifty plants.

When one has enough cuttings of a variety, divide the old roots to as many eyes as there are on the crown; pot to size required and again place in a cold frame.

If before planting time the plants are growing too fast to suit your purposes, retard them, by removing them to the north side of a building.

The commercial florist usually starts his cuttings about January, as he needs the plants for his sales, but for amateurs and private gardeners March is early enough. Our first batch was put in March 7. We kept propagating with some new varieties until the end of April.

Division of the old roots is the most easy and satisfactory way for the amateur. The old roots placed in a hot bed, or greenhouse, and kept a little moist, soon start to grow. As soon as they show their growth divide to as many eyes as there are on the crown, pot and place in a cold frame, or plant out in their permanent quarters after danger from frost is past. The roots can also be taken from their winter quarters and planted out-of-doors; but always divide the old clump. They will not make such large plants, but the flower will be better and the plants will bloom more profusely.

I believe in growing all Dahlias to single stems; therefore, all the shoots but one should be removed as soon as they appear.

LOCATION.

While the Dahlia is a very easy plant to grow, it will respond readily to some special attention. The most suitable location for the plants is where they will get plenty of sunlight, air, and moisture, as they need those elements to grow to perfection.

Before planting time some well decomposed manure is forked in, and well mixed with the soil; but if the manure is not well decomposed use instead some kind of fertiliser rich in ammonia, and if in previous years the soil has been well supplied with plant food, I would not use any kind of manure at all, as a too rich soil will induce a soft growth and poor flowers.

PLANTING.

So much has been said of late about the best time to plant Dahlias that it is impossible to give any special rule to follow on this important subject that will suit every one. My advice to those desiring no flowers, or only a few partly formed and insignificant ones, and extremely large plants, is to plant early. But if you are a lover of this plant, and wish to enjoy it in its full glory, plant late, and you will be rewarded with compact plants covered with beautifully shaped flowers.

At Malvern, our first plants were set out June 9, with our first batch of cuttings and also divided plants; and we kept on planting every week until July 11, when our last batch of cuttings, 25 plants, and newly received varieties were set out. At this writing the only difference seen is that our last planted ones are shorter, but have stronger stems and larger flowers.

The plants were set out in the kitchen garden in rows 4 ft. apart and 3½ ft. between the plants. A strong stake was placed to each plant at once, and a good watering given to firm the soil around the roots.

In a sheltered situation, if the plants are grown to a single stem, and the main shoot pinched to a certain height, no staking would be necessary; but if the location is exposed to strong winds, it is better to stake the plants.

We set the roots deep enough in the ground, so that the crown will be about 3 in. below the surface, and draw a little of the soil around the plants at each hoeing. This I like better than covering around the plants with litter; but if the soil should be very light and does not retain moisture properly, mulching is very beneficial.

In planting Dahlias in beds the approximate height of each variety will have to be ascertained before planting; placing the tallest growers in the centre, and finishing with the dwarfer varieties.

Deep and frequent stirring of the soil during early growth is indispensable to success; but as soon as blooming commences, simply stir the soil with a rake, as to go too deep at this period is apt to destroy the young feeding roots near the surface, that are needed for the development of the flowers.

If the soil has been prepared before planting, as advised, no fertiliser should be given until the plants commence to bloom; then scatter a little bonemeal around the plants, and work it into the soil. The rains will work the fertiliser down to the roots, and this will induce large and well-formed flowers.

The past season has been favorable for the growth of Dahlias, as we have had an unusually cool summer and plenty of rain; in fact, too much, as the plants have made a soft growth, and most of the early buds were blasted before developing, showing that too much water is injurious, to a certain extent. The roots being planted deep, as before stated, find plenty of moisture in the ground, and do not require any watering; but if the weather should be dry at blooming time, then give a good watering (not a mere sprinkling) and repeat it in two weeks, if the drought lasts.

As soon as frosts have killed the foliage, lift the roots, shake off the adhering soil, allow the roots to dry in the air for a few hours, and store in a frost-proof cellar, or some other cool place. If the cellar should be very dry, and not frost-proof, then cover the roots with dry sand; or where there are only a few roots, store them in boxes or barrels, and cover with dry earth, or sand.

The only disease that affects the Dahlia to any extent is mildew, which is mostly caused by climatic conditions. Keep the plants growing by frequent cultivation, and mildew will be unknown.

A very troublesome insect with us this year has been the small cucumber beetle, which feeds on the petals of the flowers. The only remedy for this pest that I know of is picking by hand.

As to the best varieties to grow the selection must depend on the grower, and he must choose according to his fancy. There are hundreds of varieties to select from, and new ones are still coming every year, so that it would be futile to name any special sorts.

Visit the Dahlia exhibitions in September, or better still, visit the establishment of some Dahlia grower, and select the varieties that you think will suit your taste and purposes.

Dahlias in England.

Amongst the flowers which are now largely used in our gardens, few are more popular than the Dahlia. The original form of this flower has undergone so many transitions that we now have distinct groups of tall and dwarf varieties, Cactus-Dahlias, too, in single and double forms, and these, with their star-like flowers and elegantly twisted petals, are certainly the most beautiful of all.

The dwarf or pompom form of the Dahlia is very useful for bedding purposes, the brilliant colors of these neat little flowers being very effective in the border. Although the blossoms are small they are so well held up above the foliage, and produced in such profusion, that they give rich coloring to the garden; and if plants are selected with care, so that the height (which varies from 4 ft. to 2 ft.) is considered as well as the tints of the blooms, few plants will give a brighter effect in a mass. Ceres, a very floriferous variety, in pale primrose, makes an excellent centre to a large bed; with Fashion, light orange, also a profuse bloomer, as the next tint; and Little Dorrit, a dwarf plant with the richest maroon flowers, as the outer circle. Or Guiding Star (a lovely white variety, 3 ft. high) may be used with Bacchus, in brilliant scarlet, which does not exceed 2½ ft. in height, edging the two with Little Sweetheart, which is a dwarf plant bearing red flowers tipped with white. Mrs. Walter Besant, in shades of salmon pink, is very beautiful; and Revenge, in rich purple and mauve, is distinct and handsome. The variety of tints is endless; but any of them which tend towards majenta are best avoided, as they never harmonise well with the rest. Messrs. Dobbie's new introduction, Mrs. Ireland, is in shades of orange-scarlet and white, a very brilliant flower, which does excellently in a balcony when grown in a large pot or a box of rich soil. In fact, all the best Dahlias can be cultivated with success for the decoration of verandahs or balconies, and, as the rooted cuttings can be obtained early in the spring, there is no difficulty in having them in bloom in June, when they will continue to supply a quantity of flowers until the latest autumn.

A new race of hybrids, combining the older Pompon Dahlias with the Cactus varieties, has lately been introduced, the lovely Aurora being one of the best of these. This is a dwarf plant, producing many flowers in exquisite shades of salmon pink and vieux rose, with a metallic blue sheen on the tips of the petals, giving it a very refined and uncommon appearance. The blooms are small and of the Cactus shape—a most decorative plant either for the border or the balcony. Cannell's Gem is a Pompon Cactus, in shades of scarlet and yellow, a glowing little flower of good form and habit, not exceeding 2 ft. in height. Crawley Gem must not be forgotten in this connection; it also is a Pompon Cactus, deep blood-red in color; and these three will probably be the forerunners of many others of these fascinating flowers, which are perfect for cutting, not being so heavy as those with larger blossoms, and consequently far easier to arrange in vases.

Of the true Cactus-Dahlias there are now a great many, but they are not all of that perfect form, with quilled petals, which is seen only in the best varieties, such as Ethel. Harry Stredwick (in the richest dark crimson, shading to carmine at the tips of the petals) is a perfect specimen of a Cactus-Dahlia; this plant, as well as Ethel, has the merit of holding its flowers well above the foliage on long, stiff stems; a point which is now much aimed at in cultivating Dahlias, and certainly it enhances their effect greatly.

Night is another of these upstanding flowers, in the deepest maroon, approaching to black in the centre of the flower, with long pointed petals of perfect shape; and Mrs. John Goddard is one of the best Cactus-Dahlias yet introduced, having the finest-shaped blossoms in glowing metallic carmine-crimson, well displayed on long stems, and excellent for exhibition or cutting.

Keyne's White is now considered to be the best of the pure white Cactus-Dahlias. It is of perfect shape, the central petals are cream-tinted; Miss Webster being almost as good, and both are worthy of cultivation.

Amongst the newest Cactus-Dahlias is the lovely Countess of Lonsdale, in rich salmon-pink, shaded with apricot at the base of the petals. This is one of the more dwarf varieties, although the blossoms are large, and will no doubt become extremely popular, for it is of first-rate shape and habit, as well as highly floriferous. Britannia (introduced in 1898) is somewhat similar—a most beautiful flower in the same shades.

Cinderella, in rich purple, is quite distinct in color, and very floriferous, with well-formed flowers of metallic plum-color, a most desirable plant; and Arachne is quite a new departure, having white petals, each broadly edged with brilliant carmine; whilst Messrs. Dobbie's Maggie Williams has fantastically twisted petals in pure carmine, a most elegant and effective flower .

The single Dahlias of cactus type are now much valued for decorative purposes, and certainly their light and graceful outlines, glowing with the same rich colors displayed by the double varieties, are unique for table decoration where heavier flowers would be out of place.

Lady Edith, a very refined blossom, in shades reminding us of a Gloire de Dijon Rose, is a new introduction in this class; Sir Kenneth is equally good, with brilliant crimson petals (an excellent companion to Lady Edith); Ivanhoe is striped, in crimson and rose color; Alice Lee, in pink, shading to white in the middle, is a very elegant flower; Pirate is in deep crimson, shading to purple at the tips of the petals; and Rose Bradwardine is bronze and yellow, tipped with scarlet—a very distinct and effective variety.

Many others almost equally good may be selected from a first-rate catalogue; and these single Dahlias are so easily grown from seed that there is no difficulty in obtaining a good collection of them, if those only which are best up to mark are kept, whilst the poorer seedlings should be destroyed as soon as detected, or the whole of the seed may be contaminated.

Dahlia seed should be sown early in the spring on a slight hotbed, pricking out the seedlings into a box of good soil while quite small, and hardening them off gradually, so that they can be placed in flowering position at the end of May, when it will be necessary to take special precautions against snails, which are specially fond of devouring them. Dusting frequently with lime or soot is effectual in dry weather, but the rain quickly spoils the burning effect of both these things, and it may be necessary to surround the young plants in this case with a circle of bran, for this is the favorite food of the snail and slug, for which they will leave all else. A visit to the Dahlias at 10 o'clock at night will reveal them at their feast, and they are then easily destroyed.

Double Dahlias are best propagated by division of the roots in the early spring. Where a large number of each plant is not required the roots may be carefully divided with a knife into three or four parts (each with an eye or place where the shoot appears), placing these divisions each in a rather large pot, with rich soil, until the end of May, when they are planted out. The best place for them is a cool frame (well protected from the frost at night) where they will have plenty of air in the daytime, for they must not be coddled, or weak, weedy, growth will be the result.

Cuttings can be taken in early spring by placing the Dahlia roots in a tray over the hot-water pipes (or on a hotbed) early in the spring, lightly covering them with rich soil. The shoots should be removed, when about 3 in. long, just at the point of their junction with the tuber, and each shoot can be potted in a thumb-pot, in light soil, sinking the pot to the rim in a hotbed, under glass. These cuttings, when rooted, should immediately be shifted to larger pots (4 in. across), with rather richer soil; and they must not be allowed to become cramped for room, as they grow rapidly if well supported, and will then flower early. If shifted into 10-in. pots in June they will be most valuable for decorative purposes, being grown in the open air from that time, when they stand well in the balcony or on a terrace.

Ample supplies of water and also of liquid manure (or soot-water) will be needed by them throughout the summer, and the soil given for their last shift should be very rich, leaving room, moreover, for a top-dressing of old hotbed material later on. The more dwarf varieties in each class are the best for pot-work, and the single Dahlias are scarcely so effective in this way as the double Cactus and Pompons, although the most useful for cutting.

After blooming (when the frost cuts them back) the stem should be cut down, and (after affixing a label of the name of each variety) the roots can be stored in a cellar (or other frost-proof place), covered with dry soil or sand, until they are wanted for slight forcing about the end of February. Special care should be taken that mice or slugs do not attack the roots when dormant; and the labels should be of zinc, or china, if possible, as otherwise it is difficult to keep the names clear, and it is very provoking to find confusion amongst them when valuable varieties are needed for propagation in spring. Dahlias in pots should be lifted under glass before sharp frosts arrive, when their flowering season will be prolonged for some weeks.

I. L. Richmond, F.R.H.S., in "The Queen."

* * *

SHRUBS.

Berberis nepalensis.

This is one of the handsomest of the evergreen Berberis, and is amongst the first to come into bloom, the flowers usually opening in August. It is known under several names, B. Beali and B. Japonica being the two most commonly used, but the one that heads this note has the claim of priority, and is the correct one to use. Under favorable conditions B. nephalensis make an upright shrub 4 to 5 ft. high, usually consisting of four to eight stout, glaucous stems, clothed with pinnate leaves upwards of a foot in length, which are of a dark shining green above and glaucous beneath. The leaves are composed of from nine to thirteen sessile leaflets, each resembling the leaf of a Holly in texture and shape, though having fewer spines. The flowers are borne in terminal upright racemes, from four to twelve of which are produced on each stem, the individual flowers being about the size of those of the common Barberry and of a sulphur-yellow color, highly fragrant. It requires to be planted in rich soil.

Portuguese Laurel (Laurus Lusitanicus).

This magnificent tree shown in full bloom, with long racemes of flowers, snowy white, 6 to 8 inches in length, is probably the oldest and finest of its kind in the country. Usually grown as a shrub, the subject of this illustration is some 25 feet in height, planted at the residence of the late Judge Gwynne, at Aldgate, South Australia, now the residence of Mr. E. Menzel.

Erythrina humeana.

Of the many beautiful South African plants this is certainly one of the best, being easily managed, free flowering, and the flowers are very ornamental. It is sometimes confused with E. Caffra, and in general appearance somewhat resembles a dwarf or stunted form of that species. It is much the better plant of the two. The one under notice makes a large bush, or small tree. The leaves are ternate, large, and handsome, deep green, with a few spines on the mid-rib. The flowers are scarlet and borne in upright racemes from near the point of each growth. The beauty of the plant may be imagined when seven or eight racemes 18 in. long, each bearing from 30 to 50 pendulous flowers, are often produced at one time on a plant 5 to 6 ft. high.

Hypericum moserianum.

During the summer months and well into the autumn this Hypericum is amongst the gayest of dwarf shrubs. Every small garden should find it a place, as it does not take up much room. It is undoubtedly the best of all the "St. John Worts." It very rarely grows higher than 2 ft. The foliage is handsome, the stalkless leaves being oblong and from 1 to 3 in. long, the flowers are compact in shape, rather cup-like, the broad, full petals being of good substance and of a rich golden yellow; each flower is about 2 in. in diameter. They are produced in terminal clusters.

Abelia uniflora.

In and around the city districts this Chinese Abelia is extremely hardy, and succeeds well in almost any kind of soils. It is a very shapely shrub of about 4 to 6 ft. in height, furnished to the ground with branches, and covered from December to February with terminal panicles of pinkish white flowers, each consisting of three or four pale red branch-like sepals. The leaves are a little over 1 in. in length, serrated, deep glossy green above, paler, and with a few scattered hairs on the mid-rib beneath. It is very similar to some of the Bouvardias.

The * Orchard.

OPERATIONS FOR APRIL.

Those who intend planting fruit trees next month should now be making a thorough preparation of the soil. It is important to get this done before the heavy autumn rains render the soil heavy and unworkable. Thoroughly trench the soil and break up the subsoil, and enrich with heavy dressings of manure and lime. The latter is a most valuable property in winter, keeping the soil clean, sweet, and warm. It is especially necessary to stone fruits. In the absence of lime, powdered mortar and wood ashes should be supplied.

Where an old tree has been grubbed out and its place is to be taken by a young tree the hole should remain open for a time to allow it to become sweetened by exposure to the weather. The debris at the bottom of the hole should be destroyed by fire, which will also help to purify the spot, and the ashes that remain will be very beneficial. The hole can be filled up with new and well-prepared soil at planting.

Root pruning is not a common necessity in this country, but it is occasionally advisable in the case of coarse, overgrown trees in a deep rich soil where they are continually growing and wood forming at the expense of fruit failures. Pear, plum, and lemon trees are the subjects that require it most. It can be done by digging a trench 3 or 4 ft. from the trunk and to a depth of about 2 ft. This should expose the main roots, which can be shortened back. The tap root must then be searched and removed. Fill up the trench with fresh soil. The first growth of a tree is the strongest, so that where the roots are pruned in this way the resulting growth will be of a much lighter character. In the case of young trees, lifting and replanting will often impose the necessary check.

Bush fruits can be pruned when the leaves have fallen.

The gooseberry bears its fruit on last season's shoots and young healthy spurs. The pruning consists in shortening shoots, thinning out spurs, and removing suckers and dead wood. The branches should be well spaced, and not allowed to crowd.

The red and white currant bear on light wood of any age. The pruning consists in keeping the bushes clean and healthy and getting rid of all crowded wood and weak stuff.

The black currant bears on wood of last season's growth. We have to leave the wood of longer growth than with the other varieties. Peaches may still have some of their light superfluous wood removed to enable the successional shoots to become thoroughly ripened. Old bearing growths, weakly, crowded, and ill-placed shoots can also be removed.

Red spider has been very active and destructive this season. A moist atmosphere and spraying with water will hold it in check. There are many advantages in spraying fruit trees at this season. A stronger spray can be used now than in the spring, when the leaves are tender, and there is also more time for the work. Shothole, rust, black spot, scale, and black aphis and woolly aphis are all more or less calling for treatment now according to the nature of the season.

The principal work in connection with vines at present is to remove damaged and useless bunches of grapes, and to keep the soil about them clean by removing decaying fruit, leaves, and other litter that would soon choke and sour it and spread disease.

The Codlin Moth.

MOUNT LOFTY GARDENERS' ASSOCIATION.

INSPECTION OF MR. SANDOW'S ORCHARD AT GRUNTHAL.

COMPLIMENTARY BANQUET TO DR. HENDERSON.

Since the appearance of the codlin moth into Australia and New Zealand orchardists have treated the codlin moth as a serious menace to the production of fruit, particularly apples and pears. The pest has increased marvellously in spite of all serious attention of practical gardeners, who have had a lifetime of battling against enemies that prey upon their labor. The moth has defied also the investigations and aggressiveness of scientists, and the concoctions of theorists. Even Acts of Parliament, that are supposed to be the last and final resource of grievances, have been set at naught by the winged beauties. Indeed, there has probably been more discussion and heart-burning controversy over the codlin moth than any other pest that has been introduced to Australia, and many a gardener, whose income largely depended upon his apple crop, has rooted out his trees in disgust and discouragement because of the wholesale destruction of his crops. The moth seemed to have conquered the position, but, thanks to the persistency, determination, and necessity of many gardeners, the battling has yielded good results. In South Australia it would seem from the history of the battle against codlin moth that it has been carried on in a very half-hearted fashion. This may be due to prejudice or carelessness, or to the fact that the gardeners have so many resources of income that they were independent of the enemy. As far back as the year 1886 we find that an official report—under the Vine, Fruit, and Vegetable Act—warned the gardeners of the great danger existing if the moth were allowed to go unchecked. From this report we note the following advice is given: "Remember that no Government proclamation or regulations will banish the codlin moth unless owners of orchards unite to carry out the same strenuously and intelligibly." Almost needless to say that the counsel holds good now, and it is really the neglect of this advice that has allowed the pest to reduce the orchards to their present state.

The gravity of the situation has long been felt, and much discouragement has arisen through lack of an easy, cheap, and effective remedy. Many experiments have been advocated, but Mr. George Quinn, the South Australian Horticultural Instructor and Inspector, fixed upon an arsenical spray as the best remedy. The composition consists of 1 lb. white arsenic and 2 lb. soda crystals boiled to one gallon of water. One pint of this mixture is added to 40 gallons of water in which is slaked 8 lb. of lime. Made one day, it can be used the next.

Mr. Sandow, an orchardist, of Grunthal, made a complete test of spraying his fruit this season with the mixture; others in the district did the same, and pronounced it a complete success. Amongst them were members of the Mount Lofty Gardeners' Association, and during the month the Association were invited by their President, Dr. W. H. Henderson, to visit Mr. Sandow's orchard, and see the effect for themselves.

Our picture shows the group of gardeners on the occasion of the visit. Mr. Sandow is standing in his shirt sleeves in the verandah of the house, while Dr. Henderson, dressed in white, can be seen seated in the centre of the group. Certainly only a small proportion of the membership, but representative and practical. Mr. Sandow has held quite a levee of visitors to his orchard this season, and never tires of seeking to inspire his visitors with some of the enthusiasm that he himself possesses regarding the efficacy of arsenical spraying. On the occasion referred to inspiration was not necessary. The practical eye could take in the ocular demonstration of beautiful clean fruit and healthy trees at a glance. The trees now in full and plenteous bearing were last year decimated with codlin moth. What more need be said. Here, for instance, was a pear tree of giant proportions carrying as much fruit as leaves, while the previous year it lost every fruit bored by the larvæ of the codlin moth. Cartloads of the fallen fruit fed to the pigs. Now there was not a dozen fruit on the ground. The secret of spraying is to keep the fruit covered with the compound from the first fall of the flower petals. As soon as the eggs are hatched the young grub is poisoned by the arsenic in its first attempt to find its way into the fruit. To complete the success the trees have to be pruned so that there is no difficulty in getting at the young fruit. This can be done by thinning out the tree as soon as the fruit is gathered in March, and then letting in the daylight as soon as the usual pruning season comes on.

In this orchard there are 2,600 trees, containing seventy varieties. At each spraying a tree receives $\frac{1}{2}$ to $\frac{3}{4}$ gallons of the mixture. It takes two men three days to cover 20 acres, using about 350 gallons per day. This season Mr. Sandow found it necessary to spray his orchard four times. It will thus be seen that the spraying is easy and inexpensive. Mr. Sandow sends all his fruit to the London market, and is well satisfied with the general results. For export varieties he recommends Rome Beauty, Cleopatra, Dunn's Seedling, Jonathan, Stone Pippin, Strawberry Pippin, Spittsberg, Nickajack, and Ben Davis.

BANQUET TO DR. HENDERSON.

The members of the Mount Lofty Gardeners' Association signalised their appreciation of the work of the President (Dr. Henderson) in his efforts to make public the efficacy of arsenical spraying as an effective remedy against codlin moth by tendering him a banquet. While doing honor, and in this way recognising the efforts of their President, the Association determined upon this form of compliment in order to gather together all the gardeners in the district, representatives and officials of the Government, members of Parliament, and the Press, to confer and spread the good tidings of having conquered their common enemy. The gathering was entirely representative. Dr. Stirling, F.R.S., occupied the chair, and in giving the toast of the evening, "Their Guest, Dr. Henderson," referred to that gentleman's many good qualities as a citizen, and eulogised his public-spirited character in giving his time and energy to a cause that was so worthy, and one that he had now come to believe was crowned with success. He confessed to having been a sceptic in the matter at first, but was now convinced that a remedy had been discovered which apple-growers could with confidence adopt, and without fear extend their apple orchards.

Mount Lofty Gardeners Visit to Mr. Sandow's Orchard at Grunthal, S.A.

In thanking the Association for the honor and recognition of his services, Dr. Henderson said that when he saw the state to which the apple industry had been brought by the ravages of the codlin moth, he felt that something had to be done, and his position gave him the opportunity when it appeared to him that arsenical spraying, as demonstrated by Mr. Sandow and others, was a success. He had done what he could to make it as public as possible, and acknowledged his indebtedness to "The Register" particularly for their publication of the successful work that had been done. He was confident that a united effort on the part of the orchardists was all that remained to secure immunity from the pest.

Replying to the toast of "The Parliament," the Minister of Agriculture (Hon. R. Butler) assured the gardeners that the Government were doing all in their power to assist the growers, and if further legislation upon the matter could be shown to be effective it would be introduced. Speaking to the same toast, Mr. A. McDonald, M.P., defended his action in introducing legislation last session allowing growers to sell infected fruit in infested districts.

Senator Sir R. C. Baker, in proposing the toast of "The Visitors," acknowledged himself a sceptic on the subject, but saw that the confidence of practical gardeners had given evidence of their success in dealing with the pest. Acknowledging this toast, Professor Perkins spoke hopefully of ultimate success, and Mr. George Quinn, who had introduced the remedy of arsenical spraying, thanked the speakers for the flattering remarks that had been made regarding his work. He felt that united effort was absolutely necessary, and as soon as the gardeners realised the efficacy of the remedy, compulsion in the matter of spraying should not be necessary.

A framed portrait of the picture reproduced in this article was presented to Mr. Sandow as a token of their indebtedness to him for his efforts in publishing information regarding the spraying. Thanking the Association for this recognition, Mr. Sandow said that he had done what he could to assist his fellow-workers in the codlin moth battle, and felt sure that by united effort, in three years' time they could keep their orchards practically free from the pest.

In proposing the toast of "The Press," Mr. F. C. Smith spoke of the great assistance the press had been so ready to give in the publication of useful information to the growers. The toast was duly acknowledged, and in responding to the toast of "Success to the Mount Lofty Gardeners' Association," Senator Sir John Downer said that great credit was due to the practical workers for the persistency of their efforts during the past season.

A number of other speakers testified to the self-sacrificing efforts of Dr. Henderson. The function was a splendid success, and much praise is due to the Hon. Secretary of the Association (Mr. Oscar Menzel) for the general arrangements of the banquet.

Vegetable Garden.

As winter approaches our chief concern in cultivating is to keep the soil warm and sweet. Any beds that are being formed at this season should be so arranged as to attract heat and throw off moisture quite contrary to the summer arrangement. Ridged land is always preferable for vegetables, being drier and warmer owing to a greater extent of surface being exposed to the sun. Perfect drainage is essential to successful vegetable culture, and, therefore, existing drains should be looked to, to ascertain that they are working properly, or a good system provided where this has been neglected.

This is a season very favorable to the production of vegetables, because there is both heat and moisture to promote vigorous growth. Plentiful sowings can be made of cabbage and cauliflower for winter planting, and sowings also of broad beans, dwarf peas, carrots, parsnips, endives, beet, lettuce, and mustard and cress. Plant out cabbages, cauliflowers, and lettuces that are ready in favorable weather.

LUCERNE.

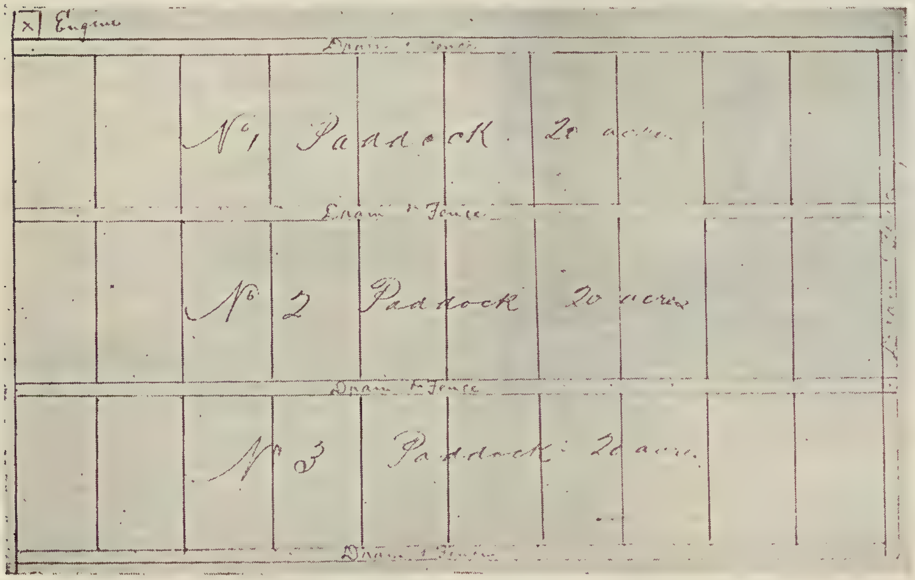
HAYMAKING.

Mr. Gatenby says in respect to lucerne haymaking: "I cut in the morning and rake an hour or two after cutting, and put it into small cocks the same afternoon. The man raking overtakes the mowers, and then goes on cocking. The next morning it is put into the stack. Most Hunter River lucerne haymakers cut in the morning, rake, cock, and have it in the stack the same evening. They say this keeps the leaf on. The stacks are only small—10 to 15 tons. It heats a little, but that only makes the hay brown, and a lot of people would sooner see it a little brown and good leaf on. If thought likely to heat too much they fill a bag with straw and put in the centre of stack, drawing up the bag as the stack progresses. In this way a round funnel is left right up the middle of the stack, and prevents a great deal of heating. This plan is worth trying. Very few people thatch lucerne stacks; put a good pitch on, and perhaps another topping up later. They will keep for ages, and throw the rain off.

IRRIGATING LUCERNE.

Mr. N. A. Gatenby uses a 15-in. centrifugal pump driven by compound condensing engine throwing about 3,000 gallons per minute. He sows about 10 to 12 lb. of lucerne per acre on land ploughed 6 in. to 7 in. deep, and cultivated to a fine tilth. He has been sowing latterly in August, but believe March and April to be better. The plant gains strength during the winter.

Re sketch showing three small paddocks, they have all small banks thrown up by the plough two chains apart; the water passes from the drain on to one or two of these basins at a time. When over the end the water is put on to the next two and stopped on the previous ones, and so on. Early next morning, if any surplus water is lying on the lower end, it is drained off into the lower drains, and so on.



Mr. Gatenby's System of Irrigating Lucerne.

* * *

DRESSING FOR LUCERNE.

The common idea that lucerne, being a leguminous crop, is independent of artificial dressings for its supply of nitrogen, is not confirmed by the results of some experiments conducted by Dr. Bernard Dyer, and described by him in the journal of the Royal Agricultural Society. On the contrary, a liberal quantity of nitrate of soda was of the utmost significance in increasing the weight of yield. This result may have far-reaching issues in connection with the growth of lucerne, for it seems that by the use of liberal dressings of nitrogenous manures land that is not naturally suited for the plant may be made to grow it on a profitable scale.

Dr. Dyer does not seek to refute the accepted truth that lucerne, like other leguminons plants, can fix and utilise the nitrogen of the atmosphere; indeed, he expressly mentions his firm conviction of the accuracy of that theory. But he contends that the plant is not capable of exercising its peculiar fuuction independently of the condition of the soil in which it is sown. If the soil is in a high state of cultivation, both physically and manurially, supplementary artificial supplies of nitrogenous manures may be unnecessary; but, on the other hand if the soil is poor and has not been over well farmed, the plant is so considerably hampered in its enriching operations as to remove its independence in respect to its requirements of nitrogen. Dr. Dyer found that the addition of 2 cwt. per acre of nitrate of soda to 3 cwt. or 4 cwt. of superphosphate and 1 cwt. sulphate of potash gave very profitable returns, that quantity being better than 1 cwt., which in turn was preferable to 4 cwt.

Dr. Dyer suggests that the case of perennial crops like lucerne, in regard to the question of self-fertilisation, differs materially from that of rotation crops, such as clover and beans. These latter have the important advantage of a good start in a well-prepared soil usually containing the residue of previous manurial dressings, whereas the permanent lucerne is left absolutely to its own resources.

* * *

School Gardens in Germany.

For nearly a century past Germany has been alive to the supreme importance of training the children of agricultural districts in the intelligent cultivation of the land, and has been advancing year by year towards the attainment of this end. Opportunities are offered at well-equipped horticultural centres to landowners who can attend within easy distance of their homes courses of instruction in forestry, vine culture and fruitgrowing, landscape gardening and horticulture, no less than to elemantary teachers, farmers, and professional gardeners, the latter classes being assisted by Government grants for expenses and fees when they are unable themselves to defray the cost of such practical education. A large proportion of elementary village schools are provided with garden ground, where the elder children are trained in the grafting and management of fruit trees, of vegetables, and of flowers as are best suited to the conditions of the particular district. Even town schools, it would seem, are not left out of the general scheme, and have their allotted garden plots. "The Garden."

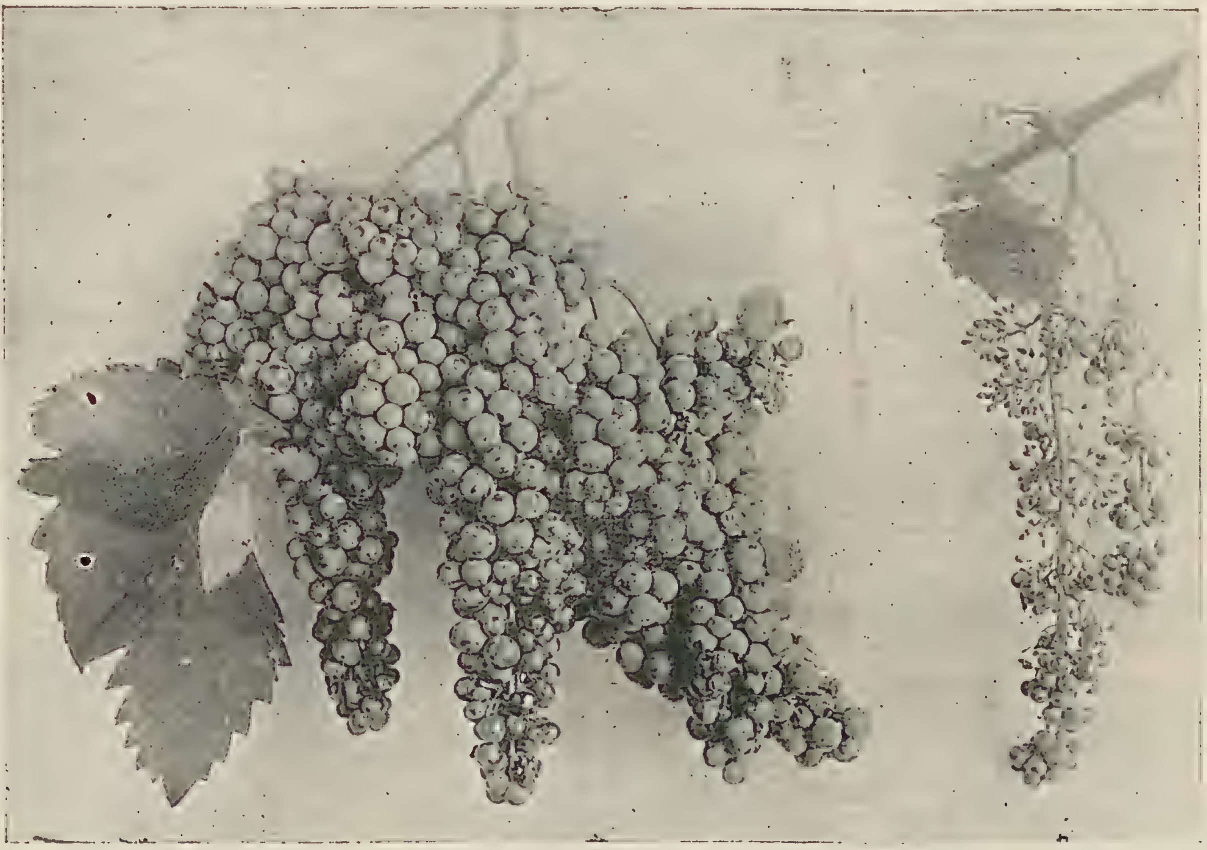
* * *

Many an ugly corner in a garden that for long has been an eyesore, because perhaps the situation is a sunless one and few plants will grow there, may be changed and made attractive if only one goes to work in the right way. Let us take the worst view of the case, and imagine no sunshine ever visits the corner in your garden, which you have given up in despair; there is yet a remedy. Why not try a hardy fernery? You may set about it at once, and so get it into shape for spring, when hardy Ferns can be planted. In country districts, at all events, one may often produce limestone and sandstone at a reasonable cost, and these, placed in desired positions with soil filled in between each, will be suitable for planting, Ferns, Ivies, etc.—W. F. D. in "Gardener."

THE VINEYARDS IN VICTORIA.

(By Professor Perkins. From "Journal of Agriculture, S.A.)

My general impression of the situation at the present moment is that vine-growing as an industry is in Victoria not only at a standstill, but inclined to lose ground. Every season is the witness of new acres thrown out of cultivation, and but little as yet appears to have been done to replace them. So far as I could ascertain, there are not more than 31 acres under grafted plants in the whole State—about 15 acres in their fourth leaf at Bendigo, about 15 at Tabilk in their second leaf, and about one acre at Ardmona in their first leaf. Nor does it seem probable that replanting on American stock is likely to take a more active turn in the near future. The position is one of considerable difficulty, which we cannot altogether view without concern. I heard it averred on all sides that even under present circumstances, the prices paid by London buyers left too love a margin of profit to encourage those who had lost their vineyards to embark on the experimental venture of American vines for special benefit of those who are doing their best to kill the industry. I do not anticipate that any except those, the magnitude of whose interests absolutely fetters them to the business, are at all likely to replant unless some special measures are taken to improve the position of the home markets. From the purely selfish point of view, we might perhaps feel inclined to shed crocodile's tears over our neighbours misfortunes; even from this, the lowest of motives I am inclined to think that it were false policy to do so. Whatever benefit we may temporarily reap, the in long run, we have no interest in seeing the area under vines in Australia reduced.


WITH MANURE. WITHOUT MANURE.

Zante Currant Vines: Two Seasons' Treatment. 1903 Crop. Grown Near Bankside.

The above picture clearly demonstrates the beneficial effects of fertilizing the Currant Vine. This Vine was treated the last two years with the Adelaide Chemical Works Company's Special Vine Manure, and while there was an apparent advantage the first season, the real benefit does not show until the second seasons' crop. It would appear that it would pay to manure the vines for wine grapes as well as currants This had already been done in some localities with decided success. The price of the manure is quoted at £6 per ton, for this Special Vine Fertilizer, which gives a handsome profit for the outlay.

I well understand that at the present moment we are somewhat overstocked with wine; but who is there that can deny that it is morally certain that we shall be understocked in four or five years' time? And what will be the consequences then? The export trade—and not the local or interstate trade—will suffer, and we shall be stigmatized as a country too much subject to fluctuations to render possible the establishment of definite and permanent business relations. To you who are aware how sensitive a thing is the wine trade, I need scarcely point out the consequences of such a contingency. And as we do not appear inclined to encourage further planting in our own State, let us hope that Victorians will find a way out of their present difficulties. I see but one way that is likely at all to prove effective, and that is that the Victorian Government, like our own, shall step in the arena, and help to further open out the London market.

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Consignment.—A shipment of 9,000 Groff's Gladioli bulbs were consigned to Smith and Menzel, of Aldgate, last month.

SCIENTIFIC.

FERTILIZATION OF FLOWERS.

(By Sigma)

This article deals with a subject of vast importance in the realm of botany, and one which ought to open your eyes to the wonders of vegetable life, wonders which exist not only in literature, but everywhere around us, at our very doors, and in the most ordinary of gardens. If I am able to direct your attention by a few examples and illustrations to this most fascinating branch of botany, I hope you will use your eyes after being opened, and discover for yourselves other cases of equal importance and interest. This article can only suggest to you what to look for; personal observation must do the rest.

Before, however, proceeding to the subject matter proper I must draw your attention to certain parts of the flower which are essential to fertilization and the subsequent perpetuation of the species. "Be fruitful, and multiply on the earth" was the command given by the Creator when animal life was brought into being. To the vegetable world also the command is applicable. Individuals have died in vast numbers, but the type remains much the same throughout all generations. As Tennyson puts it when speaking of Nature:

> So careful of the type she seems,
> So careless of the individual life.

In describing the parts of a flower essential to fertilization I must necessarily introduce you to some elementary botany, but I hope those among my readers who have gone far beyond the A B C of botany will be patient.

The stamens and pistil are the portions of the flower through whose agency fertilization takes place. The pistil being associated with the seeding part of the flower, viz., the ovary, has always been considered as female and the stamens as male. In one great class of plants these organs are plainly visible, and are easily studied. On account of their conspicuousness the class receives its name, meaning "conspicuous marriage." Where in plants these essential parts are hidden, as in the fern, the class name means "hidden marriage."

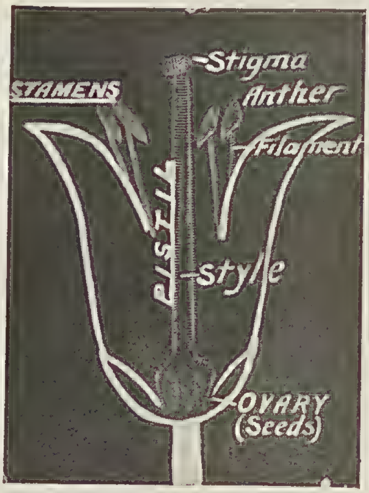
Generally speaking, all the parts of a flower are modified leaves, and traces of the original leaf form can be readily detected. This Nature shows by turning the petals of flowers into green leaves (called a freak); also in double flowers the stamens become converted into petals (the Rose). Curiously enough, too, parts of a flower are always even multiples of one another; thus, 5 petals, 10-20 stamens, and so on.

1. The Stamen.—Let us look at, first, the stamens. Each consists of a stalk or filament, and at the extreme end an anther, the latter containing a powder (generally yellow), which, when ripe, bursts from little bags which hold it. Of course, I am only describing a typical and simple stamen, as all sorts of modifications exist, some of which make it almost unrecognizable; for instance, the filament may be entirely wanting, or, as in the pea tribe, 9 of the filaments may be joined into a tube, leaving one free. In passing, I may mention that the Tetratheca (four lobes) has been so named because there are four lobes instead of the usual two in the anthers. The anther may be fixed firmly, or it may be balanced midway and swing about with the wind. The pollen referred to above is in fine grains of various shapes, and under the microscope is a beautiful object. In orchids (one of the distinguishing features) the pollen is in large masses, each mass having a supporting stalk; but more of this anon.

2. The Pistil.—The pistil consists of two parts, the style or column, generally round and with a minute channel down the centre; and the stigma (at the top), this being of all shapes, but always provided with a sticky substance near the apex.

Immediately underneath the pistil are the seed vessels. Fertilization takes place when the pollen from the stamens becomes attached to the stigma's sticky surface. Fine thread-like microscopic processes travel down the style and reach the ovaries, and as a result seeds are produced.

Fig. 1.



In a nutshell, then, the whole process of fertilization consists of the transference of the pollen from the stamens to the stigma. How this transference is brought about introduces us to the most interesting part of the subject.

Before proceeding further I must remind you that there are three great divisions of flowers relatively to their fertilization.

First, the male (stamens), and female (pistil) may be both present in the same flower.

Second, there may be male flowers on one part of the tree and female flowers on another, i.e., flowers with stamens only, and flowers with pistil only, but on the same bush; and

Third, the male flowers may be on one bush, and the female on another. In order that you may be able to see this for yourselves, let me give you examples of the two latter divisions, the first, of course, being very common.

The cucumber, castor oil, mulberry, have male flowers separate from the female on the same plant. The willow, date, poplar, sheoak, anguillaria, carob, have male on one plant and female on another.

A female willow, it is said, has never been known, all the willows of the world having been produced by cuttings from one original tree in Babylon.

Date palms are common about Adelaide, but none produce mature fruit. In Arabia the Arabs collect from the male tree the flowers that have the pollen, and, climbing the female trees, shake the pollen on to the female flowers, thus fertilising them.

Now there are three well-known methods by which the transference of pollen may take place, and cause fertilization; first, by self-fertilization, as is the case when the pollen is carried from anthers to pistil in the same flower; a most natural and easy performance you would say, seeing that the two organs are so close to one another in the flower; nothing could be more likely. Second, by the wind blowing the pollen from flower to flower. Third, by insects carrying it from flower to flower, i.e., from the stamens of one to the stigma of another. I will deal with these in order.

Self-fertilization.—The great Darwin laid it down as a law deduced from experiments that "Nature abhors perpetual self-fertilization." He was led to this conclusion by the fact that when he crossed one flower with the other the resulting plants were more vigorous and healthy than those produced by self-fertilization. We often find analogies between the animal and vegetable world, and very striking they are sometimes. Just as we know that blood marriages tend to exaggerate peculiarities even to insanity, so it would seem that self-fertilization of flowers tended to degeneracy in the same way; also it is known that a cross may be produced in the animal world between different species, but their offspring will not breed—for instance, between the hare and the rabbit—so in the plant world "hybrids" may be produced by crossing two different species, but no seeds are ever formed by these hybrids. There is no denying that self-fertilization does take place in plants, and to a very considerable extent, but in many cases it is apparently a last resource when other methods fail. I shall have occasion, however, to refer to this later on.

Wind Fertilization.—Wind is an agent which becomes of great service in carrying pollen from flower to flower, often over long distances. The pollen in such cases is generally very dry and light, and is produced in great quantities, because a large percentage may be lost in transit and thus wasted; for the same reason the stigma is very large and feathery. At times the pollen covers the ground as if sulphur had been lavishly strewn about. The anthers are turned outwards away from the stigma to prevent self-fertilization. The nettle flings pollen in the air. The fine wind-blown pollen of some plants is very irritating to the throat, nostrils, and eyes, and in some cases causes what is known as "hay fever."

(To be Continued.)

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The Australian Gardener.

FRIDAY, MAY 1, 1903.

EDITORIAL.

The May issue of "The Australian Gardener" is largely devoted to the cultivation of shrubs. It is just as easy to have flowers on shrubs as in any other form of cultivation. To those who have neither the time nor the labour to devote to the cultivation of annuals, a few good flowering shrubs can make an exceedingly pretty effect, with but little care. Another feature of special value is a review of the first part of Mr. J. H. Maiden's Forest Flora of New South Wales. While the work is confined to the limits of that State in name, it is of equal interest to other States. No one writes upon the subject with more complete authority than Mr. Maiden, and as he treats his subjects in a practical form, as well as the decorative aspect, from a gardener's point of view, we sincerely hope that the work may obtain wide circulation, and thus receive the support it so richly deserves. The subject of Australian flora has been sadly neglected in the past, although Mr. Guilfoyle, of Melbourne, amongst other authorities, have worked along the same lines as Mr. Maiden to popularise the study. Neither are we forgetful of the good work done by societies in this direction. It must be admitted, however, that comparatively little is known of the great wealth of interest that lies at the feet of Australians. For instance, the fact that the seeds of our native trees and shrubs are catalogued in foreign countries at fabulous prices is indicative of the fact that in the great commercial centres, Australia and its flora are regarded as a comparatively unknown land. The reason is simple enough. If the flora is almost unknown to its own people, it is hardly surprising that those in distant lands should know much if anything about it. Australians are still being supplied by the mother country, America, and foreign places with practically, all their garden stuff, while no country in the world could better supply outside markets, not only with the usual garden varieties, but a great quantity of shrubs which, if brought under cultivation, would find a ready market outside.

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PER YEAR.

The Autumn Garden.

> Fall!—and everywhere the sights and sounds of falling. In the woods through the cool silvery air, the leaves so indispensable once, so useless now. Bright day after bright day, dripping night after dripping night, the never-ending filtering or gusty fall of leaves.
>
> —James Lane Allen.

The dazzling splendors of mid-summer blossom have given place to the vivid tints of autumn. In the midst of our enjoyment of these autumnal glories we should take careful note of the trees, shrubs, and creepers, now that they have "put their glory on," that our gardens may be well furnished with them to yield delight in future autumns.

Autumn, like spring, is a favorite theme of the poets, although a shade of melancholy usually tinges the verse of the English poets who have been inspired by this subject. In fact, we find it described by them variously as "Autumn Melancholy," "The Year's Eventide," "Pallid Autumn." According to one poet, it is a plunderer who strips the trees and fields, to another the barber of the year, bald pated autumn who stalks about orchard, garden, and wood "shaking off fruit and beating leaves from the trees." Even the wind is said to mourn at this season, and so on until we shiver and return to our own sunny land where the hues of autumn are by no means sombre, and where we can sing in a different strain. Autumn, as the gardener knows it and enjoys it, is an importation. There was no real autumn here before the white man came and planted his slips of willow and his acorns in Australian soil. The native trees for the most part remain stolidly indifferent to its influence, and refuse to blush or to become gilded at the bidding of the frost. Now that our land has been planted far and wide with the deciduous trees from colder climes, we are privileged to share the sensations of our English forefathers, and, like them, to associate this season with "the mellow richness of the clustered trees," "the crush of leaves heard beneath our feet," with "sunlight slanting through the painted trees and hazy skies that veil the brazen sun."

If we lack the spirit to appreciate the subtle influence and associations of autumn and this superb nature painting, then the poets surely can imbue us with it. A glance at some of the lines that have been inspired by this picturesque subject cannot fail to induce the proper mood in which to approach this phase of Nature, even if occasionally, their fancies chill us. Longfellow's lines are solemn, but warm and full of color—

There is a beautiful spirit breathing now
Its mellow richness on the clustered trees,
And from a beaker full of richest dyes
Pouring new glory on the autumn woods,
And dipping in warm light the pillared clouds.
Morn on the mountain, like a summer bird,
Lifts up her purple wing, and in the vales
The gentle wind, a sweet and passionate wooer,
Kisses the blushing leaf, and stirs up life
Within the solemn woods of ash deep-crimsoned,
And silver beech, and maple yellow-leaved,
Where autumn, like a faint old man, sits down
By the wayside a-weary.

Hood's splendid lines deal distinctly with "Autumn Melancholy," who is described in the first verse thus:—

I saw old Autumn in the misty morn
Stand shadowless like silence, listening
To silence, for no lonely bird would sing
Into his hollow ear from woods forlorn,
Nor lowly hedge nor solitary thorn;
Shaking his languid locks, all dewy bright
With tangled gossamer that fell by night,
Pearling his coronet of golden corn.

and then he regretfully asks:—

Where is the pride of Summer, - the green pride—
The many, many leaves all twinkling?—three
On the mossed elm; three on the naked lime
Trembling,—and one upon the old oak tree.

What a sense of desolation is expressed in those few lines, and how mournful the vision of autumn who

Sighs her tearful spells,
Amongst the sunless shadows of the plain.
Alone, Alone,
Upon a mossy stone,
She sits and reckons up the dead and gone,
With the last leaves for a love-rosary,
Whilst all the withered world looks drearily.
Like a dim picture of the drownéd past
In the hushed mind's mysterious far away,
Doubtful what ghostly thing will steal the last
Into that distance, gray upon the gray.

Thomson, Whittier, and Keats also treat the subject in a masterly manner. Bryant takes a cheery view of autumn. His woods are full of glory, the landscape is colored in purple and gold, and "mingled splendors glow."

The forest depths are bright;
Their sunny-colored foliage in the breeze
Twinkles like beams of light.

There is no loneliness, no sense of desolation—

My steps are not alone
In these bright walks; the sweet south-west at play,
Flies, rustling, where the painted leaves are strewn
Along the winding way.

And then the inevitable lament—

O, Autumn! why so soon
Depart the hues that make thy forests glad;
Thy gentle wind and thy fair sunny noon,
And leave thee wild and sad!

But, reluctantly, to take leave of the poet's autumn and to return to our own, more especially those features of it that immediately concern the landscape garden, it should be our aim to introduce into it such an infinite variety of color and tone that at every approach of autumn we can exclaim with the poet, "What gorgeousness, what blazonry, what pomp of colors burst upon the ravished sight!" and to that end we venture to recommend a few striking colorists. The Ampelopsis, whose varieties are well known and universally grown, are conspicuous examples of autumn coloring, the shades varying from green and palest raw sienna to deepest crimson. A plant is often unobtrusive all the summer, merely lending its own particular note to the general harmony, but as soon as autumn touches it with her magic wand, behold! it emerges from its comparative obscurity, a dazzling form in crimson and gold. It is so with the Sumachs, with many one could name, and hence their value, hence their great importance in the garden. The Maples are supreme at this season, but can be grown only in cool, hilly districts or in favored positions in a lowland garden. Those who live at lower levels are not favored with the vivid tints that paint the vegetation at higher elevations. While the former must often he content with russet, the latter are rejoicing in crimsons and coppery gold. Some vines are conspicuously brilliant in the autumns; they are usually worthless fruiting varieties, but, nevertheless, claim a considerable space on a wall or trellis for ornamental purposes. The deciduous fruit trees should not be excluded from the garden simply because they are fruit trees. If their vernal, dazzling transformation is not sufficient to justify their presence, their rich autumn coloring at least should ensure them a place. The ochre leaves of the pear become suffused with rich crimson, and the cherry takes on a warm, ruddy gold. The mulberry, too, is not only picturesque in form, especially when it arrives at a patriarchal age, but in autumn it coins a rich pure gold. Oaks, elms, plane trees, and poplars all more or less light up the landscape with varying shades of russet and gold. From the graceful birch tree there is a steady drip, drip of gold till all its leaves are down.

As a brilliant feature of the autumn the mountain ash must not be omitted, whose hues vary from ruddy gold to crimson, according to the altitude at which it finds itself, and the degree of frost. The English ash tree, very deservedly called the "Venus of the woods," is of surpassing delicacy and grace at all seasons. In its autumnal raiment of gold it appears even more ethereal, and its leaves flutter to earth in a feathery flake like snow.

◆

Phloxes are easy to propagate. The best plan is by taking cuttings of young shoots, dibbling them into pans or a bed of sandy soil. This may be carried on any time in the summer, and plants thus procured are much stronger than where propagation is effected by division of roots. If one can spare a frame and make up a bed of leaf-mould and sandy loam, a nice stock of plants may soon be got together for blooming the following year. In planting them out in the garden one should if possible, give them a deep soil enriched with rotted dung, as they pay one well for liberal treatment and benefit greatly by a cool bottom, especially in a dry season.—WOODBASTWICK.

The Flower Garden.

Operations for May.

The work of digging, trenching, remodelling flower-beds, and all necessary alterations should be persevered in whenever the weather is favorable. The planting of deciduous trees and shrubs should not be postponed later than this month. The hints given elsewhere in connection with planting orchard trees applies equally well to the planting of subjects in this department. Neatness and cleanliness is the principal consideration all the year round, but at this season it is more difficult to maintain a trim appearance. Exhausted summer flowering annuals and biennials, fallen leaves, and every scrap of litter and untidy matter should be promptly carted away to the rubbish pits or heaps, where, together with the accumulating waste of the house and garden, it will be gradually converted into valuable manure. The winter garden can never attempt to rival the summer garden in wealth of bloom and color, nor is it altogether desirable that it should, for, as Dean Hole remarks with reference to winter gardens: "He who feasts every day feasts no day, and with flowers, as with friendship, a little absence makes the heart grow fonder." It need not, however, be wholly destitute of color. During the bulb season, which may be said to begin with the autumn Crocus, and to continue with short intervals until the last Poeticus Narcissus in the spring, no garden need look dull, but as we have already recommended for the culture of this class of plants in a specially allotted space of their own, we should depend on something of a more permanent character to relieve the gloom of winter. For this purpose some of the variegated evergreens are admirably suited, among these the golden-leaved Oleander (Nevin variegata), variegated Abutilons, viz., Darwin tasselatum and Andenkennan Bonn, the latter a lovely variety, with maple-like leaves, Eleagnus ferruginea aurea, Coprosma variegata, the golden and silver variegated Euonymous, Pittosporum eugenoides argentea variegata, Deeringia Amhersti variegata, New Zealand variegated Flax, golden and silver grasses, all these effectively disposed and grouped among darker evergreens, or seen through and forming a contrast to the dark and lacy forms of the deciduous subjects, do a great deal towards cheering and lightening the otherwise sombre aspect of the garden. In addition to these attractive foliage plants many flowering shrubs, including Pyrus Japonica, Ribes' yellow and pink flowering currants, and Berberis contribute bright color when color is scarce.

Dahlias and Cannas can now be cut down and lifted to facilitate digging, and to allow of the soil being renewed from which they have been taken. The former should be allowed to dry a little before being placed on the floor of the shed or cellar, where they are to remain for the winter. They should be carefully labelled with their respective colors as a guide in planting when the season arrives. Cannas should be divided if necessary. Michaelmas Daisies, Rudbeckia, Perennial Phlox, Helianthus, Heliniums can also be lifted and divided annually. Lift everything that it is convenient to do, so as to enable the digging to be done more thoroughly, and the soil to be more easily renewed.

Anemones supply bright patches of color in the winter and early spring. Plant them out now about three inches deep, covered by a light soil, in lines or groups as preferred.

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PRACTICAL POINTS.

Escallonia Macrantha.

This charming rose-flowered shrub succeeds well in most localities. Its rich, glossy green foliage and compactness of growth renders it invaluable as a garden shrub. It is also useful as a hedge plant, being of vigorous growth, and stands cutting. Cuttings may now be put in, half sand and half loamy soil, and place in cool frame.

Fuchsias.

Cuttings of Fuchsias should now be put in. This will produce excellent material for next spring. It never harms Fuchsias to prune severely.

Philadelphus Coronarius.

The Syringa, or Mock Orange, as this shrub is popularly called, is a great favorite with most people, and most gardens, even those of small dimensions, include it among the occupants. Its popularity is due to several causes: Firstly, it is an exceptionally free flowering shrub, and secondly, the flowers are of good size, and very fragrant; thirdly, it blooms during January and February, after most of the flowering shrubs are over; and, fourthly, it thrives in almost any kind of soil, and often under very adverse conditions. It is an extremely old introduction, numerous varieties have been raised. A few of the best are Double-flowered Flore Plena, the White Variegated, the Golden-leaved Aurea, Tomentosus, Lemonei, Microphyllus. Cuttings of soft shoots root readily in a close frame in early summer.

Many people think that Ferns should not be given liquid manure. This is a mistake, as a little decayed manure liquid, given once a week is excellent; as also is weak soot water applied twice a week during growing season.

Verbenas make bright and beautiful beds during the summer, and are easily raised from seed or cuttings.

Carnations in pots need careful watering in winter. Always allow the soil to become fairly dry before giving a fresh supply, and if grown under glass, give plenty of ventilation.

With one or two exceptions, the older varieties of Zonale Geraniums compare badly with the newer sorts, and should be discarded in favor of the latter. The time is at hand for propagating plants for flowering next season; it is rather later for cold districts.

Adiantum Farleyense should not be frequently repotted; this noble fern is impatient of root disturbance.

Leonotis Leonurus, from leon, a lion, and ous, an ear; in reference to the fancied resemblance in the corolla. It is a very ornamental, small-growing shrub, with long spikes of brilliant scarlet flowers. It is sometimes called a Salvia, which it resembles very much.

When planting dwarf budded Roses, see that the union is placed below the surface of the soil; this will give the Rose a chance to make roots upon its own account.

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NATURE STUDIES.

PLANT LIFE.

By F. Scott. Elliot, 352 p., 3/6.)

It speaks well for the demand for Botanical literature that this excellent work can be published at so small a price. It is concerned with descriptive botany from the most modern point of view, and lays under contribution the works of German as well as English writers, besides the author's own observations. It ranges from the giant Eucalypta to the microscopic Diatoni. It has more than forty illustrations and diagrams, and a complete index. Needless technical words are carefully avoided, for, as the writer remarks, modern botanical terminology is appalling. The kind of information given is just that which is interesting to ordinary observers, and while the common examples cited are intended for Scotch students, the same principles apply to our own native flowers, which much stand in need of systematic study. Where every statement is interesting, it is difficult to select for quotation, but one or two may be chosen which are probably least known. Thus, in speaking of hardness, it is stated that "the curious glossy shell produced by the enlarged tract of Job's Tears (Coix lachryma) is as hard as opal." Also that the average breaking weight of the seeds of the Dog Rose was 33½ lbs.; of the Australian Peach stone 117 2-3 lbs.; and that it required over 2½ tons pressure to crack a Brazilian nut. Again, in another table, it states that, areas of section the same, New Zealand Flax was twice as strong as copper wire.

THE HARDINESS OF CHOISYA TERNATA.

[FROM THE GARDENER.]

This pretty shrub is a great addition to the garden; its distinct and uncommon foliage has an excellent effect among the more familiar subjects, while its blossom, scented after the manner of White Thorn, is very charming. Unfortunately, many people are under the delusion that it is only hardy in the extreme south of England; and more than once in the neighborhood of London I have seen this shrub grown in pots and removed to the conservatory for the winter. Now to me it has always been one of the most interesting phases of gardening to test the hardihood of some of these doubtful subjects, and last winter, having struck during the summer a cutting of this Choisya, I deliberately stood it in the pot in the most exposed position I could find and never moved it, whatever the weather, during the whole of the winter and the severe spring that we all remember followed it. Never once did the shrub show signs of distress. And we must bear in mind that it is a far greater ordeal to have a plant outside in a pot than it is to have it firmly established in the ground. I think this experiment may be of interest to those who hitherto have abstained from planting this shrub lest it should prove unable to face a winter—it is a type of plant far too decorative to be dispensed with if it can be made to succeed.—F. M. Wells.

CHOISYA TERNATA.

◆

Lord Curzon of Kedleston, Viceroy of India, used to prune and nail up, and otherwise cultivate, the Roses that grew in his father's garden, adjoining Kedleston Parsonage, Derbyshire. He now occupies the magnificent viceregal residences: one at Calcutta that cost £150,000 to build.

ROSES FROM SEEDS.

HOW TO CROSS FERTILISE.

[BY IOTA.]

I am trying to put into words the little bit of practical knowledge I have acquired concerning the hybridization of Roses, so as to make it serviceable for anyone who knows a little less about the subject in question.

The point really is to get ripe seeds. Everyone who is interested in this note has a few Roses in flower in June. It is easy to protect a few blooms in some way, e.g. remove the lid from a cigar box (100), and put a sheet of glass in the place of the bottom, afterwards fixing the box at a suitable height above the bloom by nailing it to a stake. The bloom will then get the light and heat, but no rain.

The blooms so protected are for seed parents. The pollen parents can be cut and kept in water in a room till required. The pollen is ready soon after the bloom is fully open at the centre if the flower is kept dry and in a sunny place. A warm, sunny day is best for operating.

When one of the protected blooms is at its best, and before it opens its eye, the petals are gently pulled apart and the centre is fully exposed. It will be found that the stamens are not ripe, and the pollen is held securely in the anthers. Now gently dust the stigmas with the pollen from the cut Rose which you desire to use for crossing. The latter is best carried in the hand of a second person. With a small pair of tweezers pick out one or two of the ripe stamens and rub them against the exposed stigmas. There is a clear, sticky exudation on the stigmas to which the pollen adheres, and one can see at a glance when sufficient pollen has been dusted on to cover the stamens. Use as many stamens as are necessary to do this.

You are now at liberty to pick away from the seed parent its own unripe stamens. Remove a few petals to enable you to see what you are doing. Do all this leisurely, thoroughly, but very gently. Then adjust the glass protector to keep out rain. Some hours afterwards repeat the pollination. Next day do it a third and last time, to make sure, using the same pollen parent, but not necessarily the same bloom, at each operation.

It is well to put a fine muslin bag over the bloom and tie it round the flower stalk immediately after the pollination, so as to keep insects with pollen from other Roses out of the way. This muslin bag can be left on for a week. It will be well to do two or three blooms in case of failures, ticketing each with the name of the pollen parent.

In a fortnight or so you will see whether your efforts are likely to be successful. Let us suppose it is the middle of July, and you find you have a pod swelling nicely under its glass protector. Tie the shoot to a small stake to prevent the wind doing mischief. On a sunny day you may remove the protector, to get all the sun and light possible. But take care to keep the pod covered on very wet days. Except for this, let the plant grow and flower as it likes, removing the flowers when half open, to keep up the vigor of the plant.

So things will go on till late in October, when the pod will be full sized and beginning to ripen. Now it is well to pot the plant if it is a Tea Rose. Put it in a good sized pot, taking up some earth with the roots. Reduce the long roots to get it into the pot ,and use rather light soil with good drainage and no manure. As soon as potted cut away half the plant gently with a pair of scissors. Stand it in a sheltered, shady spot for a few days, or, better still, put it in a shady frame. Spray it with tepid water each day for a week, and then remove it to a greenhouse. Gradually bring it into the sunniest position, and let it stay there till the seed drops off. This will be about the end of February perhaps. Only water when the pot rings clear. Be careful not to move or shake the plant much, and have the seed stalk tied to a small stake.

Hybrid Perpetuals often mature their seeds quite well in the open, and are not greatly affected by ordinary winter frosts. But let the pod remain on the plant till the New Year or longer. Against a south wall they ought to seed perfectly well. Even against a wall I have found Gloire de Dijon, Reve d'Or, and W. A. Richardson refuse to ripen, though they had good seed pods. I have successfully ripened seeds of several well known Teas, e.g., Marie Van Houtte, by potting them up at the beginning of November as I have described. By ripe seeds I mean seeds that have yielded healthy seedlings afterwards.

Those who grow Roses under glass can pollinate in April, and ripen the seeds by the end of October.—The Gardener.

SOUTH AFRICAN FLOWERS IN THE MONTH OF MAY.

By Catherine C. Hopley.

Though April and May are in reality autumn months at the Cape, it is interesting to the English visitor to observe how very closely they resemble the Northern spring, both in weather and in vegetation. The caprices of April display themselves similarly in showers and sunshine alternately, and the same kind of chilliness in the atmosphere is perceptible as here when we say, "Rain is in the air." And, in addition to this, you see the fields and roadsides, which for months have been brown, barren, and unsightly, suddenly clothed with green, and within a week with flowers, brilliant and abundant, that you have never seen before, and you cannot divest your mind of the impression that the season is actual spring, and not autumn. April is truly "the opening month" there, as at home, and May, as in England, sees the landscape at its freshest. The reason is evident. The summer heat and drought, which baked the earth deep down, and rendered it in many places actually hot to the touch, is now succeeded by rains, which turn it into a veritable hotbed, and act like magic in clothing the dried-up and barren places with verdure. This may not invariably be the case; nor may the change be so sudden in all parts of the extensive area that we call South Africa, which embraces such varied physical features; high mountains, rocky and rugged, deep and well-watered valleys, elevated table lands, and vast desert regions where during the dry season not a drop of water is seen for miles. Consequently the climate also varies considerably, and the seasons are less marked than in Europe, those of agriculture and vegetation being more dependent on the weather. Dependent also on another evil, locusts! Rains may be propitious, and vegetation correspondingly luxuriant, but the locusts on their part may defeat moisture, and every green thing may vanish in twenty-four hours. Drought and locusts are the two natural enemies of the colony.

But there were no locusts in the part where I was that year, the extreme South, where the natural condition seemed more of spring than of autumn. It was in September, the actual spring, when I first saw the Cape, and then most of our common English garden flowers that had been acclimatised were in bloom. Daisies, pansies, stocks, pinks, wallflowers, &c., besides the countless native plants known only in our greenhouses in England. But the acclimatised plants looked as if they had never been out of bloom, and more as if they were "going off," as our perennials do towards the end of summer. It seemed as if the climate had turned the annuals into perennials. Remarking on this to the superintendent of the Botanical Gardens at Cape Town, he said: "On the contrary, it is the colder climate that has turned some of our constant bloomers into annuals;" that in the colder regions there was a much longer period of the year during which vegetation is checked, when plants and trees hybernate in fact; whereas at the Cape the repose in vegetation is very short, acclimatised trees shedding their leaves for a period of six weeks only, or two months at most, and this often during the hottest season. Indeed, I do not remember seeing any tree ever quite bare of leaves as in our English winters, as the new growth begins before the old leaves have all fallen. The true winter or period of rest is, therefore, estivation rather than hybernation. "Ours is a winter flora," said Professor MacOwan.

And thus it was that in May, the first winter month of the almanac, the ground is covered with a new and brilliant carpet of blossoms; though they sometimes begin to appear in March and April. At this season every bank and bit of roadside waste is spangled with the lovely little oxalis, sometimes one color predominating, sometimes several colors in the same locality. In May, too, in our English woods the wood sorrel is in bloom, and its delicate white petals veined with purple are familiar to sylvan ramblers. We have also a yellow species, a trailing sorrel less common; but the Cape species, pink, white, crimson, yellow, are as abundant as primroses are in our English copses. More so, indeed, because not growing in clumps from one large root, they overspread the ground without a vacant space, and look so soft and lovely and attractive that you feel disposed to make a couch of the bank and bury your face in the exquisite masses. But they are too beautiful to be crushed, and you fill your hands instead. After the first rains the countless bulbs push up their scapes with incredible rapidity; then follow lilies, irises, gladioli, numerous species of amaryllis, and many other plants for which the winter temperature is sufficiently mild. And all these are "wild flowers," of which you may gather armsful and no one say you "nay." Of pelargoniums there are 174 known species in Cape Colony, and most of them continue to blossom the whole year round. Some become veritable shrubs of 9 or 10 ft. high, with stems as big as your wrist. So, in fact, do the heliotropes and verbenas, one species on Table Mountain having stems stout enough to be suggestive of cultivation for timber! This is the season of the yuccas also, which, with their long and splendid spikes of white blossom, grow to a height of 15 or 20 ft., and are very conspicuous in the gardens. As far as vegetation is concerned, we may thus say there are two springs in South Africa, viz., the actual spring of lengthening days and increasing heat, which is our autumn, and the floral spring, which follows the autumn rains, which is our spring also.

During the latter there are more of the delicate herbaceous plants like the wood sorrel and other lovely little native species too numerous to mention. These cannot stand the summer droughts. But during the former—the orthodox spring—the characteristic plants of the country thrive; bulbs, tubers, and the thick-leaved kinds which have adapted themselves to the climate. Everywhere abound the fleshy-leaved cacti, opuntias, and mesembryanthemums (of which there are several hundred species) and others which store up moisture in themselves and exist throughout the driest season. An agriculturist told me that during seasons of drought sheep—and especially ewes with lambs—feed freely on the mesembryanthemums, whose succulence enables the animals to do without water. Remarkably abundant are the various species of these mesembryanthemums which serve so useful a purpose; some are very large, as big as a great cabbage, and with brilliant blossoms. In some regions vast tracts are covered with these succulent plants to the exclusion of almost all other vegetation, and they present a brilliant mass of colors where but a few weeks ago the ground was blackened by the summer drought as if a fire had swept over it. Among the succulent classes, or those which store moisture in either leaves or stems, must be included the euphorbias, one of which commonly known as Fingerpoll, holds so much moisture that in times of serious drought it is cut up as food for cattle. Some of the aloes strike one as almost grotesque in their form. They have an arboreal stem of huge proportions, surmounted by a mere tuft of leaves, which look ridiculously unimportant on this vast trunk. There was one in the Botanical Gardens at Cape Town whose stem was like an immense barrel in form, the very largest "hogshead," out of which grew a trivial bunch of greenery. But those massive trunks possess an excessively hard and dense exterior to defy evaporation, while within they are soft and spongy, holding sufficient moisture to sustain the roots of the bulby shrub in the driest of seasons. In the moist low-lying lands the arum abounds. You can trace the course of a stream by the line of its pure white spathes which, at a little distance look as if a stationer had been tearing up his entire stock of writing paper and scattering the pieces wherever he walked. As we pass through our greenhouses and hothouses at home we do not give much thought to the countries to which we owe so many of our most beautiful flowering plants and shrubs; but we shall find that to no country so much as to Africa are we indebted for them, for no single country of the world has contributed so largely to European gardens and conservatories as the Cape of Good Hope. To the botanist the Cape has been a source of pleasure and delight from its very first settlement.—The Globe.

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Lord Dundonald's garden at his estate, Adare, is very much given up to Roses.

The tree that vies with the Birch in spring beauty at the bursting of the leaf is the Larch, but it grows to larger proportions than is advisable for a really small garden. The Laburnum is highly to be recommended, and also the Catalpa, but this last casts rather dense shadow. An apple tree is by no means to be despised, and in size, habit, and decorative value is hard to beat in the small garden, besides, its fruit is useful.

THE VIOLET.

The present is a good time to make fresh plantations of this universally popular flower. When planted early they soon get established, and a fair crop of blooms may be expected in early spring. If fine flowers and plenty of them are wanted, the plants must be cultivated, and not neglected, as they sometimes are. The violet delights in fresh soil; it will not thrive in sour or exhausted land. It revels in decayed leaf-mould; but this valuable plant-food cannot often be obtained. A sandy, turfy loam, with about one-fourth part of well-rotted cow manure mixed with it, makes an excellent compost. The plant is fond of lime, and if there be none in the soil a little should be added; it tends to keep down worms and insects, to keeps the soil sweet, and helps to cause vigorous growth. Poor stunted growth causes the plants to become a prey to red spider; and this involves attention in the way of sulphuring and syringing. If good soil and an abundance of water can be provided, almost any fairly open situation will suit, but a partial shade protection from north winds and very hot suns is generally better. Division of the roots and by runners are the common methods of propagation, but cuttings taken off in the spring make plants less liable to form runners, which, of course, weakens the parent plant.

Fragrance in the violet is of greater importance than even size or color. Length of stem, its stiffness and suitability for working-up into bouquets, and also freeness of blooming should be considered in selecting varieties. The sweetness of the violet is very evanescent, few flowers so much so. A bunch of blooms in twenty-four hours after being gathered has already lost the best part of its perfume when two days old its smell is suspicious, and on the third day it should be thrown away. Yet, if a box in which fresh violets have been packed be promptly closed up, the delicate violet fragrance may be detected there in all its purity many weeks after.

Violets should be gathered as early in the morning as possible, and their stems at once placed in water. If the flowers are to be sent away for some distance each bunch should be hooded over with a sheet of paraffin paper for protection, and to confine the fragrance. Our florists, when packing the flowers, usually lay the bunches close together in single layers on flats, which rest on cleats in the packing-boxes, but sometimes shelves are used in which round holes have been cut to hold one bunch each.

The popularity of the violet is as old as is that of the daffodil or the rose. In ancient mythology it was dedicated to Venus. When Athens was at the height of her glory bunches of violets were exposed for sale in the market-place at all seasons of the year. From the days of Homer the beauty and fragrance of the violet have furnished a favorite theme for poets. To Shakespeare it was a type of modesty and maidenhood, and Scotland's poet agreed with the Bard of Avon, for he also wrote: "The violet is for modesty."

Melbourne violet-growers cultivate a good number of varieties. In doubles, the old Marie Louise is perhaps the most popular; its lavender and white flowers are very fragrant, and the perfume lasts longer than that of many others; it is a fine winter bloomer. Mrs. J. J. Astor has not, we think, yet been offered for sale in Melbourne, but English ladies prefer it to any other, because of the heliotrope scent and soft, mauve-shaded color; it is a free flowerer, and of healthy growth. Lady Hume Camubell is a fine double hardy, and late in blooming. The old Neapolitan has plenty of admirers; its light, mauve-colored flowers are very sweet. Count Brazza or Swanley White is the best double white. Marguerite de Savoi is a large, deep blue; a very free flowerer.

Single violets are much more numerous than doubles. The Princess of Wales is by many considered to be the best; the rich violet-blue blossoms, borne on long, sturdy stalks, are very fragrant; the flowers are very large. La France is of the same type as the Princess of Wales, with flowers as large as a florin; the habit of the plant is dwarf and compact. John Raddenberry is a slaty-blue, hardy, and very distinct. Sulphurea is a little gem, flowers small, when gathered very pleasing. Luxonne is a violet-blue, large, admired for its graceful bearing, and valued for its lengthened season of bloom. Admiral Avellan is very distinct in color, not particularly attractive on the plant, but when gathered its reddish-purple blossoms are conspicuous when placed alongside the darker purple sorts. Princess de Sumonto is a blend of clear blue and white. St. Anne's Pink is a curiosity; its name gives the color. Parma Perfection is a very early bloomer; a favorite in England. The three kinds last named have not yet been circulated with us. White Czar is pure white, but it becomes a nuisance from its seeding so freely. California is a very large purple, of great fragrance, very free blooming, and a vigorous grower. Italia, a violet purple, large and robust. Wellsiana and Lee's Odoratissima are also favorite violets with some growers.—"Australasian."

EVERLASTING PEAS.

For the covering of walls and trellises for entrances to gardens, for edging flower borders, for divisions between the vegetable and flower garden, for covering rustic arbors and porches, and for forming excellent floral backgrounds, very few herbaceous plants are more beautiful or more useful than the Everlasting Peas. A mixture of pure white, blush, pale rose, crimson, and pink trained to poles 3 feet high, and fastened at the top, form, during the summer and autumn months, a picture difficult to surpass. Delighting in a rich, deeply worked soil and sunny positions, they grow luxuriantly from seed sown in the early spring in the open, while the best white and pink varieties are easily propagated from cuttings taken in April, or as soon as growth appears above the ground.

Slips 3 or 4 inches long, with a heel of the underground rhizome, quickly roots in pots of moist sand if kept in a close cold frame. Everlasting Peas are not so fragrant as the annual varieties, but they occupy permanent beds, and give no further trouble beyond a yearly mulching. When cut and arranged with an abundance of leafy foliage, they form a picture equal to any made from the annuals.

The new white Everlasting Pea is a distinct advance, and every garden should have a clump or two. R. EVANS.

DECORATIVE SHRUBS.

Too many of the plants in our shrubberies can scarcely be called decorative, for they produce no flowers worthy of the name, and yet there are so many beautiful flowering shrubs that this state of things ought not to be tolerated by those who love their gardens. Every autumn a few good plants might be selected, placed in positions in which they will do well, when the whole aspect of our shrubberies will gradually change from monotonous green to a really beautiful group of rich coloring, constantly changing with the season, as each shrub blossoms, whilst some of them finish off by changing the color of their foliage into brilliant scarlet and yellow in the late autumn. One of the best is

THE DOUBLE DEUTZIA CRENATA,

which produces in the spring the neatest little rosettes of pure white blossom, almost covering the long sprays of light foliage; and then, again, in the autumn the leaves change to many shades of red, purple, and yellow, so that the plant has two distinct seasons of singular beauty each year. It grows into a neat, compact bush, about five feet in height, and its graceful foliage is always pleasing to the eye.

BUDDLEIA GLOBOSA,

too (the Golden Ball of Japan), is a handsome and distinct shrub with foliage unlike anything else, lined with silvery-white, and a mass of singular ball-like blooms in May, giving the plant a bright and decorative effect. This plant grows to the height of six or seven feet in a warm, sheltered corner, and becomes broad in proportion. Even if cut back by a more than ordinarily severe winter, it will shoot again from the base, and quickly make up for lost time if well supported. Then

THE SINGLE JAPANESE ROSE,

Rosa rugosa, when grown as a shrub, is very handsome, not only when in bloom, but also in the autumn, when covered with large, scarlet berries; it should not be pruned too severely, merely cutting out the older wood in the autumn, and reserving all the strong shoots of the present season for next year's flowers.

The Japanese Wineberry,

Rubus phœnicolasius, is slowly finding its way into our gardens. This is a most desirable plant, perfectly hardy, and easily cultivated, which produces a fruit of delicious flavor in August, and is always decorative, with its rich red-brown stems, covered with a rufous tomentum, and bright scarlet berries, changing to a clear cornelian as they become ripe. This rubus should have, if possible, a sunny place, where its long autumnal shoots will be well ripened; and rich soil, with a mulch of cow manure in spring, for it suffers much during a drought unless its surface roots are covered. It will then provide a fine crop of fruit, and its new growths (sometimes twelve feet in length) can be tied over in arches, in the same way as raspberries, when they will bloom and fruit at every shoot the following season. As soon as the fruit is over in September, all the old wood should be cut down to the ground, and the fresh growths may, if preferred, be pegged down into the soil, when the tip of each will produce a new plant in the spring, after which it can be cut off just above the young plant, and trained in arches, as before suggested. This is an excellent plant to hide a fence about six feet high.

The Syrian Hibiscus,

Hibiscus syriacus and varieties, is a very pretty shrub, with handsome blossoms; and Escallonia macrantha (although perhaps too delicate for a cold position) is very beautiful when its dark green shining leaves are covered with rich pink blossoms. It may safely be cultivated in the south of England, and in Ireland, but an extra severe winter is apt to injure it somewhat. The same may be said of

The Mexican Orange,

Choisya ternata, but it is well worth a trial for its handsome foliage and the masses of orange blossom it produces in June.

Lilacs,

especially the large flowered varieties, Philadelphus coronarius, the Mock Orange, and the lovely flowers of Weigela rosea, must not be omitted, for these three old favorites should be in every garden.—"Amateur Gardening."

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TABLE DECORATIONS.

(From "The Gardener.")

Well as one may know Dielytra formosa in the border, one must see it thus, with the white cloth beneath it, to have any adequate idea of its exquisite color and formation. In this case a veritable wealth of the pink sprays had been picked.

At another time the beautiful spurred and named varieties of these latter day Columbines were used. Columbine is a much more charming name than Aquilegia for these flowers, and as I have the authority of the dear, old-fashioned Philip Miller for so choosing to call them, I hope I shall be forgiven.

Now these, again, are flowers that by reason of their drooping habit of growth fail to display much of their beauty out in the open border, and need to be picked and enjoyed at close quarters. In the table decoration in question the Columbines were mixed with Maidenhair fern. As a rule, one thinks twice before putting this fern with out of door and hardy flowers, but there need be no hesitation in placing it with so dainty a type of blossom as the Columbine. The result is all that can be desired. There are few flowers more beautiful in coloring or form than these. The white blossoms have a touch of cream in them; the yellows in some cases are almost transparently clear, in others toning to buff; while the variety in which yellow and pale mauve are combined is perhaps the most beautiful of all.

A June table decked with these flowers is a picture long to be remembered and cherished.

Other hardy flowers that are beautiful as table decorations are the pale lavender blue blossoms of Scabiosa Caucasica. They are, perhaps, the coolest looking flowers that we possess, of easy culture too, and blossoms are yielded over a long period. The flowers last well in a cut state, and are borne singly on long, slender stems.

Galega is another cool looking subject, whose beauty is much enhanced by the white tablecloth, and it has a charming look during hot weather.

This same housewife has a way of making a striking table decoration composed of fine heads of the ordinary yellow bedding Calceolarias, mixed sometimes with the early blossoms of double Helianthemums.

Few summer arrangements, however, exceed in beauty a combination of white and pale blue Campanula persicæfolia. It may be noted that this is more successful for the lunch table than for lamplight, as the blue loses much of its charm in artificial light.

In autumn the Cactus Dahlia makes a pleasant change. No one would ever dream of putting Maidenhair fern with the older forms of this plant, but with these Cactus Dahlias no sense of incongruity arises at the combination, and the beauty of the flowers is considerably enhanced.

There are people with skill to make a delightful table decoration of so commonplace a flower as the Nasturtium. This artist housewife is one of these, and she was quite ready to explain the secret of success. She is always careful to gather for each vase a whole plant—flower, leaves, and root together. The roots, together with superfluous leaves, are cut off. Sometimes one plant can be broken into two or three parts, and thus suffice for as many vases. These plants, or portions of plants, are the foundations into which blossoms picked separately—and thereby ensuring a variety of coloring—are arranged. She also added that Nasturtiums need to be picked and put into their vases as many hours as possible before they are wanted for the table, as the flowers and leaves have a habit of settling themselves into the most artistic positions if left alone for some time. Another flower that is treated in the same manner as the Nasturtium is the spring Forget-me-not.

Shirley Poppies are a favorite decoration. Sometimes they are used with Maidenhair fern, and sometimes without; the delicacy of the texture of their petals, and their beautiful coloring justify its use. The Poppies are invariably gathered early in the morning, and immediately have their stems sealed by being held over a lighted taper. Thus treated, they last for two days.

Speaking of this subject of sealing the stems of Poppies, which holds good for the Shirley and Iceland varieties does not answer in the case of the larger Oriental kinds—they last long in water if exactly opposite means are employed, i.e., they require their stems to be split up for two or three inches.

The above is only a small selection of the charming subjects grown in the "table border," and of the rest I hope the Editor will give me the opportunity to say more another day. F. M. Wells.

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A NEW USE FOR SUMMER CLIMBERS.

By setting up a few of the now fashionable bamboo poles, or even humbler-looking wooden stakes, at 6 feet intervals around a small lawn, and festooning a light chain or a stout wire between these, a pretty support for summer climbers is obtained. I have seen even a rope used between the poles, drooping, of course, not stretched tight, and the effect was good when the climbers had covered it; before this desirable consummation there was a suggestion of washing day!

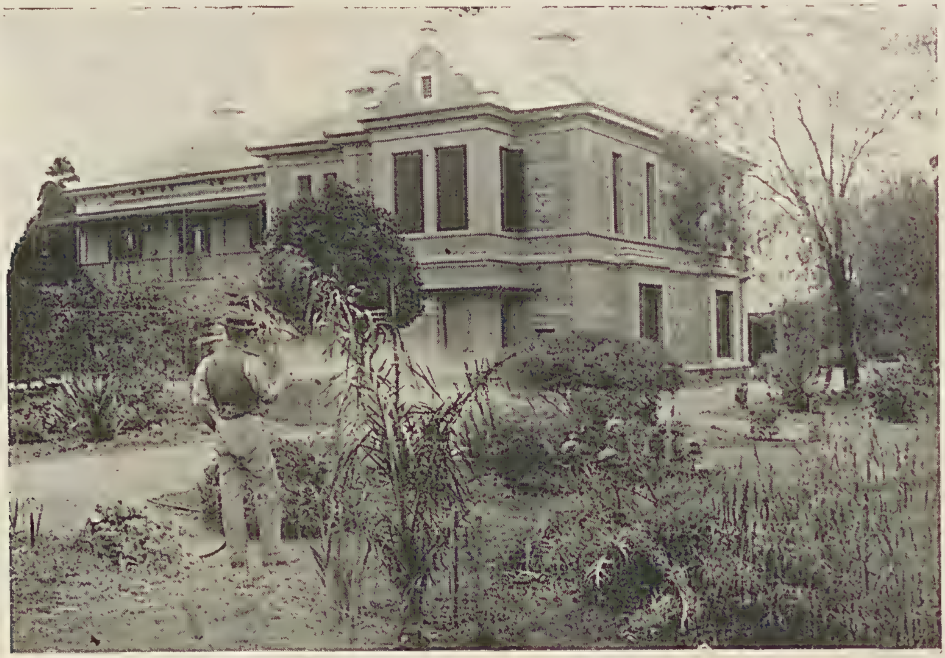
Of course, a few poles, with wire netting stretched between them, make a most useful erection at the end of a small tennis lawn, to keep the balls from invading a neighboring garden, and this can all be creeper covered if the wire netting is painted over.

Canary Creeper, which grows so marvellously fast, and makes such a show in one season, is quite one of the prettiest annual climbers to treat in these styles; Convolvuli make more of a screen, and Nasturtiums are most brilliant, besides offering seed pods that some persons delight in pickled! The pergola kind of arrangement first suggested makes a pretty avenue bordering to a gravel walk.

Those who cultivate the beautiful Cobœa scandens, either in the purple or white variety, will find this a good way in which to show off the plants.—M. Hawthorne in "The Gardener."

ST. CATHERINE'S.

"St. Catherine's" is the residence of Mrs. Angas Johnson and her son, Mr. Lisle Johnson. It was one of the first of the few genteel residences built in what was then known as Prospect Village, adjoining the northern boundary of the City of Adelaide. It stood in a group of five or six estates, surrounded by large areas of fields. During the past twenty years these fields have been cut up into building allotments, and, although the larger houses still retain considerable ground surroundings, the place became thickly populated, and Prospect Village, as a beauty spot, had to give way to what is now known as the District of Prospect, embracing a considerable population, with the usual tramway service which follows in the wake of closer settlement.



St. Catherine's, Prospect, S.A. The Residence of Mrs. Angas Johnson.

When the late Mr. James Angas Johnson purchased "St. Catherine's" with about five acres of land, he set to work at building on to the original house and planning out the grounds. The plan embraced the idea of planting a hedge of boxthorn all round, and in the subdivisions of the estate's garden and paddocks. The hedge grew to splendid proportions, and some twelve or fifteen feet of its height hides the public gaze from the roadway. The front entrance is from the Prospect-road, or, correctly speaking, Eliza-street, named after a daughter of one of the pioneer settlers of the district. There was apparently no attempt at landscape effect in the design of the garden or the approach to the house, which consists of a long, straight drive to the southern corner. This is continued along the front of the house, and with a sweeping curve joins the straightway again for exit. This arrangement left a heart-shaped centrepiece of considerable size, which is planted with a miscellaneous collection of trees, shrubs, and flowers, with a small lawn and fountain facing the front of the house. Although lacking in design either in the laying out or in the planting, there is a peculiar charm about the place, easy to realise, but difficult to describe. And therein lies the secret of the late Mr. Johnson's pleasure. He apparently disliked anything in the way of artificial gardening. Allow the things to grow naturally was the gospel of his gardening pleasure, and the gardener became possessed of an absolute fear to put a knife or shears into any tree or shrub. This idea of natural growing is abundantly manifest in a section of the garden devoted to the growth of forest trees and shrubs, which has never been touched by a garden tool of any description after the first planting. Mr. Johnson's idea was that if one pruned or cultivated the soil about the Australian shrubs they died; since they are dependent on their surface roots for nourishment. The idea is borne out by the late Professor Tate, who argued upon the same lines. This part of the garden was known as "the scrub." It is about a chain wide, and runs the whole length from the street to the back of the house. No attention whatever was allowed to this section beyond keeping the fencing in repair to prevent the escape of some emus that were kept wandering there to possess the place of an air of natural originality.

Another striking feature of the garden is a large, unapproachable, vicious-looking Cactus bed. Taking, then, the large centrepiece in front of the house, the native reserve (or scrub), and the Cactus bed, we have the three principal features of the garden, though not all of it. These features may certainly combine to make a garden in the domain of a gentleman's residence, and as such may give infinite pleasure to the proprietor, which it apparently did, but from an artistic gardening point of view it is badly within the bounds of comment. The charm of it, however, is interesting, and may possibly lie in the discovery of unsuspected treasures, which meet the search here and there.

Entering by the front gate we note first that the box hedge forming the front fence hides an area of lucerne, adjoining which is the tennis court. Immediately inside the gate is a Buddleia Madagascarensis. This had grown to immense proportions before a storm capsized it. Cart loads of it were taken away, and, the stump being left, threw up a nice new growth, promising to reinstate its previous glory. Looking up the drive the old native pines do not strike the eye as being either useful or ornamental, their only redeeming feature being that they are at home in their own land. And we also note another homeland plant (Tecoma Australis) twining it tendrils affectionately around its stronger supporting native brother. An effort was made to get a bordering of plants alongside the drive on the native reserve side, but beyond an edging of Echeveria secunda, very little could be grown. A few steps forward brings the visitor to the Cactus group, of which we give a picture. This group has been growing into an inextricable mass of wildness that defies description, as it does the gardener. The plants were collected during Mr. Johnson's travels abroad, and put in there never to be disturbed. In this heterogeneous mixture we pick out Aloes, Crassulas, Cotyledons, Yuccas, Agaves, Opuntias, Rocheas, Echinocactus, Palms (Chamaerops excelsa, &c.), Stapelias, Cereus, and Pritchardia filamentosa. The two Opuntias, towering up some fifteen feet in height, show that the somewhat hungry soil, with its limestone foundations and the heat, favor their growth. The specimen bearing the yellow flower we take to be Megacantha, from Mexico, and the red bloomer, Glaucophylla. The Aloe, with leaves in shape like a dinner knife, and commonly called the Knife Aloe, is Plicatilis. Belonging to the Liliacea order we note Haworthia, answering to the description of spiralis. A variety of Cereus claims attention by the sexagonally and deeply divided stem, the edge of each division carrying spines, which are only to be looked at, not touched. This answers to the name of Chalybaens, but might have another. The Opuntia cylindrica is a forbidding-looking specimen, with its scales like a snake, and the top of each column carrying three or four spines. Another variety, designated Aristata, carries a crested top with round bracts, but the spines look vicious enough to leave their fixture and run through the inquisitive searcher after novelties. There is a subtle fascination about a wild-looking Cactus bed such as this. Such a spot will probably not be met with in any other garden, and the longer one lingers by it the keener grows the pictures of desert stretches and mountain wilds. If, perchance, the visitor lingered thereabout till the pale light lost itself in a dismal twilight, and his thoughts became depressed with the moaning of the pines, the imagination would easily figure in the group, sinewy serpents, creeping things, and eerie sprites of questionable shape.

Had the light been that of a dull evening as we turned away from the Cactus bed, and the eye caught a snakey-looking Cactus specimen twining around the trunk and limbs of a neighboring pine, there might have been some excuse for an impromptu exclamation of a name appropriately suitable to the plant. In broad daylight, however, the name was calmly enquired for, and the information gained that it came from somewhere in travels abroad. Touching upon this, by the way, we noticed lately that a botanist, writing to one of the English gardening magazines, made a strong plea for a classification of Cactuses upon a systematic basis of nomenclature. We were not surprised at the plea, but another botanist, who had apparently specialised upon the tribe, affected to be very much upset at the idea. The present arrangement of nomenclature was as good as it could be, he argued.

Behind the Cactus bed one sees Doryanthes excelsa, the gigantic lily of Australia, in bud; it has only once flowered in this State, and that was at St. Catherine's about ten years ago. Also one sees the Custard Apple, and the Japanese Date Plum (Diospyros kaki) in full bearing; as well as a magnificent collection of Cannas.

The southern bordering to the drive we see the gardener has been growing Annuals and Roses against long odds of heat and under drainage, the soil apparently having about as much consistency as a sieve for holding water. Over the bordering we perambulate through the native reserve. The Cocos plumosa, from Brazil, evidently did not appreciate its adopted home, and the Yucca aloefolia might have presented a less gaunt appearance with a little attention, but a Kaffir apple alongside had developed some very business-like spines, and the Mock Orange (Philadelphus coronaria) is also a very fair specimen. In front of the glass-house, which contains a number of Aspleniums, Geraniums, Altenanthera, Gloxinias, Asparagus, and a few other things, we noted a good specimen of Acacia soligna. Others coming under notice were Acacia Julibrissin, Acacia Ccuminata, Xanthorrhæa quadrangulata, Tamarisk, Myalls, and Hakea multileanata which goes under the name of Grammatophylla. This a native of Port Lincoln, and its long, showy, pinkish red blooms, borne in spike-like umbels, gives it rank as one of the finest natives of Australia. Two specimens of native peaches are looking well, and bear good fruit. These make pretty trees when the bright red fruit is ripe. The Caffre bean (Schotia latifolia) also does well away from its native habitat in South Africa. Round about the wicket gate shown in the picture we can see also Lagunaria, Pinus halepensis (Aleppo pine), P. canariensis, Dracaena drago (dragon's blood), a Western Australian Eucalypt, Robina psuedo-acacia, Hakea eucalyptoides, bamboos, Carob bean (Ceratonia siliqua), and two or three very fine Acacias. A specimen of Farnesiana from Central Australia is one of the best, with its long racemes of yellow flowers.

St. Catherine's.—Cactus Group.

In the great medley of growth are also Oleanders and fig-trees. Beyond the Boxthorn hedge is a paddock devoted to growing feed for the prize beauties in the stables, and a part also reserved for the kitchen chef.

Now, turning to the great heart-shaped centre facing the house, we find a miscellaneous collection of trees, shrubs, and flowers, the citrus tribe being the prevailing growth. The lovely Erythrina cristagalli demands attention, also the Yuccas, and the Palms, Chamaerops fortunei, and Phœnix reclinata, Cycas revoluta, Bouvardia Humboldti, Tecoma Australis, Polygala, Roses, Livistonia Australis, Dombeya Nataliensis, Strelitzia Reginæ, Pritchardia filamentosa, Viburnum, Opulus, Hisbiscus, and a number of annuals are grouped here and there, also Templetonia retusa, and Clianthus punicens. From the front of the house we pass under a Cloth of Gold archway on to the lawn, and across to the fountain, wherein are growing Nymphaeas, and around the edge we note the native Nardoo, Chloris latifolia, Cyperus, and Cannas. On the eastern corner of the lawn are Statice arborea, Swainsonia Osbornii, Tecoma Velutina (yellow), and T. Smithii (orange), while at the back is seen Tecoma rosea, Cordyline Australis, Cape gooseberries, Brugmansia sanguinea, and B. Arborea. Passing out of the lawn through an archway of White Banksia to the north, we come upon the drive again, and note good specimens of Hibiscus splendens and Choisya ternata, Jacaranda mimosafolia. Fruits, flowers, and shrubs of various orders are bedded along the drive until we come again to the Cactus group. Before reaching here, however, we pass away to the right, and two bushes of Bauhinia purpurea and alba in profuse bloom catch the eye, and also a double Punica nana fl. pl. This pathway leads to the tennis court, surrounded by high netting, covered here and there with Tecomas, Wistaria, Passifloras, Phaseolus, Clematis, and grape vines. Retracing our steps to the house we pass a number of fruit-trees, amongst them being a flat peach from Japan. The peculiarity of the fruit is its round and flat shape, instead of the usual globular form. Coming up to the northern corner of the house we see specimens of Doryanthes and Clivia Miniata, and a trellis of Mandevillea suaveolens and Tecoma chiare. Alongside a plant of New Zealand flax (Phormium tenax variegata) is a fine specimen of Erythrina splendens.

St. Catherine's—Entrance to the Native Reserve.

An inspection of a shade-house in course of erection, and the stables, the denizens of which Mr. Johnson is proud, and, partaking of his kind hospitality, completes a visit to the very interesting, if not artistic, garden at "St. Catherine's."

SWAINSONIA GALEGIFOLIA ALBA.

This, also known as the New Zealand Vetch, is a capital subject for clothing a portion of the back wall of a greenhouse, or in similar positions. It may be grown in large pots, but succeeds much better planted out in a border of prepared compost, as it then grows more luxuriantly, and produces its flowers with greater freedom, both the size of the flower and the strength of the spike then being considerably enhanced. A compost of two-thirds loam and one-third leaf-mould, with a liberal addition of coarse sand, suit its requirements admirably. When in full growth the roots demand an abundance of moisture, and timely attention must be given to the regulating and tying in of the young growths ere they become entangled and untidy-looking. During the winter months the plants should be given a thorough rest, consequently but little water at the roots is then needed. Before the plants start into growth they should be relieved of quite two-thirds of the previous season's growth, which makes them break strongly and imparts extra vigor to them. As it is a free rooter it is always prudent to afford a top-dressing of fresh compost each season as soon as the pruning and tying are completed. The flower-spike and blossoms are similar in appearance to those of the Everlasting Pea, but are not quite so robust. They are very useful for cutting, as they may be employed for bouquet making, dinner-table and drawing-room decoration, with excellent effect, particularly if cut with a piece of stem and accompanying foliage. After the plants have done flowering the young shoots may be used in various ways, not the least of which is in mixing them with cut flowers in vases. If loosely and informally disposed they greatly add to the general effect of any arrangement, and such as it is almost impossible to obtain with the shoots and foliage of any other plant at this season of the year.—A. W.

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POISONOUS FLOWERS.

People who are fond of flowers will learn with some surprise that quite a number of favorite blossoms are actually poisonous, and should for that reason be handled with extreme care. Generally speaking, all flowers grown from bulbs are dangerous in sick rooms, and there is no doubt that Hyacinths, Lily of the Valley, Tuberoses, and Narcissi should never be sent to invalids, since they may prove as harmful to a person in a critical state of health as a dose of morphia would be—without, of course, the benefit which that drug sometimes confers. Another common flower whose odor is noxious is the Poppy, which causes violent headache, together with a disinclination to move about.

Naturally it requires a very large number of Poppies to cause such results, and the handful of blossoms cultivated in our gardens can scarcely be called dangerous. In Asia Minor, however, where large fields of Poppies are cultivated for their opium, tourists have often been miserably ill for hours after inspecting the plantations, and two cases of death among English tourists were traced to this cause last year. The Primula, too, which is such a favorite flower, should only be handled with extreme care. One variety, known as Obconica, is so dangerous that if there is a scratch or a prick on the hands when touching it an unsightly skin disease is certain to appear, accompanied by a painful itching. This spreads to the body, and is, as far as we know, incurable. Sometimes, however, it takes the form of erysipelas. This kind of primula, which is known as that of "Baby," because of its numerous small Primrose-shaped flowers, on this account had better be severely left alone.

* * *

SELECTION OF TREES FOR THE SMALL GARDEN.

Trees have a use beyond their decorative value; they supply the welcome and necessary shade, but this in the small town garden should be in proportion to the limited space; and trees should be planted with careful attention to this point. We sometimes see some large and wide-spreading forest tree usurping almost the whole space; and, in addition, darkening every room looking out upon it. Perhaps, of all suitable trees, the Silver Birch has more to recommend it than any others. It is singularly graceful in its habit of growth; it is one of the most beautiful of trees, especially at the time that it bursts into leaf; and its shade is less dense than is usually the case with forest trees, while in autumn its glowing tints make a beautiful picture. What a pity it is that the great beauty of this tree is often hidden when used within the garden limits! The birch tree, more than most trees, requires to be seen full length, and not hidden for 10 or 12 feet by an under planting of shrubs. Cut down the shrubs, and in their place, if you will, plant Foxgloves and common Fern, and the beauty of your birch tree will be increased a hundred-fold.—"The Gardener."

* * *

THE FERN BEECH

is a subject greatly deserving of notice. Its deeply cut foliage makes it highly picturesque. This tree makes charming greenery for house decoration during the summer, and on that account alone might well be the representative tree of the small garden.

Answers to Correspondents.

FLOWERS.

Lift Dahlias when their tops are dead, and store in a dry place. A start to dig flower borders may be made this month, giving well rotted manure where required. Roses that have lost their leaves may be shifted with safety towards the end of the month; also shrubs and trees. Plant out first sowing of hardy annuals.

KITCHEN.

Cut down Asparagus as soon as the tops have withered, and give a good dressing of well-rotted stable manure, and fork in lightly. Plant cabbage and cauliflowers, sows peas and broad beans for a succession, also carrots, parsnips, onions, &c., if not sown last month; thin crops in good time, and keep free from weeds, and the soil well pulverised. Earth up celery, attend to rhubarb and sea-kales; clear away all dead leaves, and give a good dressing of manure.

"WALNUT."—The botanical name of the Walnut, (i.e. "foreign nut"), is Juglans regia—Juglans being "Jovis glans," so that the Walnut is the "Royal nut of Jupiter." It is a native of Persia and of the Himalayas, and is the type of the order. The wood, it is well known, is esteemed for furniture and gun-stocks, and every one who gathers the nuts knows that the husk yields a dye that stains the skin too permanently. If a piece of the husk when fresh is tasted, it stings the tongue like mustard, and this acridity successfully protects the growing seed from birds and insects. From the sap of the tree sugar is made, and from the seed a useful oil is expressed. An infusion of the leaves is recommended to disguise the taste of cod-liver oil. If the nut be gathered before it is ripe, the husk does not separate from the shell, but if left on the tree the husk splits irregularly and the nut falls. If the husk be now examined it will be seen that on its inner surface a net has been formed which acts as a separating layer.

"SPIREA."—Yes, Spireas are very easily grown, and amongst the most profuse and elegant blooming shrubs. We recommend the varieties, Van Houteii, Thumbergii, Paniculata rosea, and Rotundifolia.

"ORNATE."—We agree with you that ornamental grasses are not sufficiently grown. We would advise chenille grass (Chloris latifolia), Zebra grass (Eulalia Japonica zebrina), Cat's tail grass (Pennisetum villosum), and the Himalaya fairy grass (Miscanthus Nepalense).

"Scavenger."—Pigs are excellent scavengers for an orchard, but we have seen sheep recommended as better.

"Carnation."—The disease is anthracnose. It is a fungus, and weak dilution of Bordeaux is recommended as a prevention.

The Forest Flora of New South Wales.

* * *

By J. H. MAIDEN.

We are pleased to receive from the pen of Mr. J. H. Maiden, Part I. of the "Forest Flora of New South Wales," published under authority of the Hon. the Secretary for Lands by the Forest Department of New South Wales. The Government Botanist of New South Wales is the acknowledged authority on forest flora in the Commonwealth, and a publication in this form is heartily welcome. It is absolutely true, as he says, "that nought but good can spring from an extended knowledge of these trees and of the timbers and other products yielded by them. The object of this work is to depict the botanical characters of each tree, and to furnish all the available information in regard to it. There is no doubt that residents in the bush will welcome means of testing the information thus given and of adding to the stock of knowledge. This country has been settled for little more than a century, and the greater part of it for less than that. We possess a large endemic vegetation, and it is not a matter for surprise that our knowledge of many of our trees comes far short of those of longer settled countries. When we have precision in the discrimination of our trees and of our timbers accurate knowledge of them by the timber-getter, saw-miller, timber merchant, and user generally will advance by leaps and bounds. Some of the trees are remarkable for their beauty, and many of them are of high botanical interest. Large numbers of them have already been proved to be of considerable economic importance." Mr. Maiden's observation is timely, that "it is a fact that exotic trees are often cultivated simply because their seeds are more readily obtainable than those of the native species." We should like to emphasise this remark, and point out how peculiar it is that so few of our native trees and shrubs are brought under cultivation. This, we think, is very largely due to lack of information on the part of city and suburban gardeners, and also we think large fault lies with those in the nursery trade, who have special opportunities for bringing under the notice of gardeners our native beauties. In this connection we might mention incidentally the Grevilleas, Hakeas, Myrtles, and Acacias. But with a practical eye to business, Mr. Maiden further remarks that with regard to their timber qualities, have we not much to learn as to their durability for fencing and mining. And, he might also have added, railways, wharfs, jetties, and building. But, he proceeds, have we not much to learn of the adaptability of our timbers to some of the commonest uses, and in regard to special uses he draws attention to the possibilities in wood-paving, parquet flooring, carriage building, wood engraving, carving, brushmaking, casks, and boxes. He also puts in a plea for knowledge regarding wood pulp, and the value of timber ashes, and says that the list might be made out to a wearisome length. We heartily endorse the hope that this work will receive large public support. It is issued at one shilling per part, or ten shillings for a set of twelve. The plates are beautiful and accurate descriptions, executed by Miss Margaret Flockton, and Mr. Maiden also acknowledges valuable aid from his assistants, Mr. Ernst Betche and Miss S. Hynes.

The subjects under description in Part I. are:

Grevillea robusta (silky oak).
Ficus rubiginosa (rusty fig).
Syncarpia laurifolia (turpentine tree).
Pittosporum phillyræoides (narrow-leaved Pittosporum).

We are pleased to note that the first of the series opens with one of the Grevilleas, of which there are nearly 200 species. In the October issue of the "Australian Gardener" we wrote a special article upon Grevilleas, making mention of their adaptability to cultivation, and the beauty of a number of the most readily procured varieties.

As might have been expected, Mr. Maiden deals first with the botanical features of the genus, and the species under particular notice. The botanical, vernacular, and aboriginal names are interesting. Robusta, strong and firm; silky oak, from the silky underside of the leaves or the bright appearance of the freshly split wood; and the aboriginal Warra-garria, tuggan-tuggan, Koomkabang, presumably from any circumstance that may have played upon aboriginal genius, superstition, or what you will. The writer then goes into particulars upon the leaves, graceful and fernlike, for table adornment, its orange-yellow flowers, rich in honey and ornamental, and the fruit with winged seeds, and the timber. By-the-way, we make bold to suggest that the descriptions of the plates could be advantageously printed at the foot of each plate.

Regarding the suitability of the timber for wine casks, the opinion of Mr. Thomas Hardy, of South Australia, is quoted. This experienced winegrower tested the wood by placing shavings into the wine for two months without affecting the taste, and pronounced it suitable for casking. Other instances of its suitability for mercantile purposes are also quoted in regard to dairying utensils. Millions of feet of this timber exists in New South Wales, and not a stick of it is used, but it is found in use in Ceylon. The difficulty appears to be in a deposit in the heart of the tree which injures the saw. Ceylon planters, however, speak of it as "one of the most valuable gifts which Australia has bestowed upon Ceylon." The seed germinates readily, and is worth the attention of those in charge of our forest reserves.

Ficus rubiginosa—the Rusty Fig—is the second subject for treatment. The botanical description states that the tree is of considerable size, with spreading branches, throwing out woody roots, which descend to the ground, forming pillars as in the Indian banyan tree. The vernacular names are Port Jackson fig, Illawarra fig, Rusty fig (because of the ferruginous appearance of the young shoots), Native banyan, Narrow-leaved fig. A number of aboriginal names are also given, amongst them being Baira, Warrauka, and Pingy. The nurserymen catalogue it under the name of Ficus Australis. It can be readily identified by similarities in common with the Moreton Bay fig (Ficus macrophylla). The species is very largely cultivated, particularly in New South Wales. Exceedingly ornamental and affording beautiful shade, it is suitable for public reserves and parks. The timber is practically valueless, but the fibre of the roots is highly esteemed by the natives for their fishing nets. A large amount of interest attaches to this tree because of the experiments that have been conducted upon the exudation of a "milky" juice. This was thought to contain caoutchouc substance of commerce, but the properties are up to the present valueless.

Syncarpia lauriofolia—the Turpentine Tree. The botanical name is derived from sun (together) and karpos (a fruit), alluding to the fruits growing together. The vernacular name, turpentine tree, is described as unfortunate. It is suggestive of inflammability, while as a matter of fact it is one of the most unflammable, and carries no odor. The name is given because of the resin which flows from between the bark and the wood. The aboriginals have named it Booreah, Burra Murra, Killa Warra, and Pearbbie. The timber of this tree is recommended under proper treatment for cabinet work. Its chief value is its durability, resisting decay in the ground whether from white ant or other causes, resistance to marine borers, and for building purposes in resisting fire. It is reported that the girders and joists of this timber in a building saved it from being gutted by a large fire. The Legislative Assembly of New South Wales called for a report upon this timber with reference to its resistance to the destructive toredo. The evidence contained in the report is very conflicting, but the finding of the jurors is that "the turpentine will resist the cobra (toredo) as well, or better, than any other hardwood, provided the bark remains uninjured." The article further states that "this tree is one of the best indigenous shade trees in the States. It is gregarious, and its noble, leafy head makes it an ideal tree under which to put garden seats, or to serve as shelter trees for men or animals in a paddock, or as specimen trees to give a park-like appearance to the land."

Pittosporum phillyræoides — narrow-leaved Pittosporum. This is described as a small, graceful tree or slender shrub. The name is derived from pitte (to pitch) and sporos (a seed), the seeds being sticky and sometimes black, like pitch. The vernacular names are butter bush, willow-tree, poison berry, and quinine-tree, each being descriptive of some peculiarity. It may be remarked that it is not poisonous, but the berries are very bitter or acrid. It carries also a number of synonyms, owing to its variableness. The leaves are spoken of as being very valuable in time of drought, when sheep and cattle browse upon it. The dwarf character of the tree makes the timber of no value, except for the purpose of turnery. A fanciful little legend is given as coming from an aboriginal, who stated that when nobody lived in the country a long time ago, one of the berries opened, and out came a beautiful young black gin. She lived upon hunting, but pined for a mate. She noticed one day a bush with seed pods upon it, and as she watched it a fine young fellow came out of one of them. They greeted each other, and lived happily with their son and daughter, who settled upon the same lines lower down the creek." The name of the seed pod that produced the blackfellow has not yet been discovered.

We repeat our commendation of this interesting and instructive work upon forest flora, and trust that a wide circulation of it may result in the cultivation of many of our native trees and shrubs, not only as additional ornaments to our public and private gardens, but also in our forestries for their commercial economic value.

We shall look forward with pleasure to the second series, which we may anticipate to be equally as full of interest and instruction as the first.

[Note.—Since writing the above Part II. has come to hand, and will be placed under review in our next issue.—Ed.]

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PLANTS BENEATH TREES.

The complaints that plants will not grow beneath trees would not be so numerous were cultivators more frequently to take a common-sense view of the matter. More often than not the trees beneath which plants refuse to grow are of secondary importance; in many instances their death would not provoke tears. Why not, then, make them suffer, that the plants inserted beneath them may benefit.

Trim off as many of the lower boughs as circumstances permit; the tree will not die. Then with a good sharp spade dig a good dressing of well-decayed manure into the area it is proposed to plant. Hundreds of fibrous roots will be sacrificed if this operation is well carried out. But do not worry; even this will not cause the tree to succumb, unless it is made of softer stuff than any I have dealt with.

With soil thus prepared, and a compensating use made of the hose and water can to atone for rains kept off the ground by the tree's leaves, almost any plant will grow with a fair measure of success. Certainly, very many of our annuals will do so. The system is, in fact, best suited to the growth of annuals, as their death and removal gives an opportunity of indulging in a yearly digging and manuring.

Tobacco Plants, Calceolarias, Mignonette, Night-scented Stocks, Candytuft, Godetias, Limnanthes Douglasii, Phlox Drummondii, Pansies, Forget-me-Nots, Violets, Lilies of the Valley, Solomon's Seal, Dielytras, Asperula odorata, Solidagos, Foxgloves and Canterbury Bells are eighteen kinds of plants which have proved successful under this treatment. The perennials were replanted every two years after the leaves had fallen from the trees, which in the particular instance I have in mind were Limes.—E. J. C.

* * *

THE CANDLEBERRY GALE.

Growing in the Melbourne Botanic Gardens, also to be found occasionally in private gardens, is the Candleberry Gale, or Myrica cerifera, a dwarf deciduous shrub, not of striking appearance, but well worth a place in the shrubbery, on account of the delightful fragrance its leaves give off when slightly bruised. The bush does best in a moist peaty soil. It bears in profusion wax-like berries, which in parts of the United States of America are made into candles which burn with a sweet smell. Kalm, a Swedish naturalist, wrote of the Candleberry bush as follows:—"There is a plant from which a kind of wax or tallow is made, and for that reason it is called the 'tallow' shrub. The berries look as if flour had been strewd on them. They are gathered late in autumn, being ripe about that time, and are thrown into a kettle or potful of boiling water. By this means their fat melts out, floats at the top of the water, and may be skimmed off into a vessel; with the skimming they go on till there is no tallow left. The tallow, as soon as it is congealed, looks like common tallow or wax, but has a dirty green color. By being melted over and refined it acquires a fine and transparent green color. This tallow is dearer than common tallow, but cheaper than wax. Candles of this do not easily bend or melt in summer, as common candles do. They burn better and slower, nor do they cause any smoke, but yield rather an agreeable smell when they are extinguished. In Carolina they not only make candles out of the wax of the berries, but likewise sealing-wax." Some persons put the candles out on purpose that they may have the incense of the expiring snuff. The plant is propagated by seeds and by layers.—"Australasian."

* * *

Pope Leo XIII. does not mind how strong are the perfumes of flowers, and annually delights in the Narcissi, Hyacinthus, and Lilies of the Vatican garden.

CAMPANULA PRYRAMIDALIS.

Having had during the past summer some unusually fine plants of Campanula pyramidalis, I have pleasure in giving a few details as to the method of culture followed.

The seeds were sown at the end of March in shallow boxes, only slightly covered with fine soil, and placed in a warm house. As soon as the young seedlings were large enough to handle they were pricked off into larger boxes. After becoming established in the boxes they were subjected to cooler treatment, and finally towards the end of autumn were planted in a cold frame, in which they were wintered, the lights being off on all possible occasions.

About the end of the following August they were planted out in the garden on a piece of spare ground, and received no further attention than an occasional hoeing. In December and January some of the stronger plants threw up flower spikes, but owing to the late sowing they were not very fine. About forty of the weakest of them were allowed to remain in their position, where they made fine clumps and stood the winter. In the following March they were dug up and potted in 6-in., 7-in., and 8-in. pots. Many of the large roots had to be cut off to get them into the pots, but they appeared to suffer but little from it.

After potting, the plants were stood outside in a sheltered position until the color of the flower could be seen, when they were placed under glass. I should say that as soon as the flower spikes began to appear they were frequently fed with manure water. When fully developed they made grand objects for house and conservatory decoration. The best plants had twenty-seven fully developed spikes in an 8-in. pot, and the smallest out of forty plants had twelve spikes in a 6-in.—average for the lot more than twenty. The strain was Suttons' white and blue.

It may be said that they were on the ground a long time, but by sowing every March a succession of fine plants may be had every season; and, further, this method of culture is well within the means of most amateurs. We have, of course, grown them in a quicker way, but we find it necessary to sow very early in the season and grow in heat for some time to get good plants for flowering the following summer, and then we do not get them with twenty-seven spikes. Further, during the early part of the year most of our boxes, pans, hothouses, &c., are full up with bedding stuff, whereas in March plenty of boxes and pans are lying empty, and can be utilised for seed sowing.—H. W.

* * *

The children of H.R.H. the Duchess of Fife, are busy growing Hyacinths in glasses on their nursery window sills.

EURYA JAPONICA LATIFOLIA VARIEGATA.

A BEAUTIFUL FOLIAGE PLANT FOR THE COLD GREENHOUSE.

I seldom see this plant without wishing that its merits were better known to the large class of gardeners styled amateurs. The professional gardener, as a rule, knows it well, and does not hesitate to take full advantage of its useful qualities. For decorating halls and corridors, dwelling rooms and cold conservatories, this plant is very hard to beat, and it may be employed in all sizes, from the pigmy in the 3-inch pot to the specimen plant in the 12-inch size.

Cuttings strike freely, although, perhaps, a little slowly, as the plant is hard-wooded. Young shoots, about half ripe, are the best to use, and they should have the assistance of the propagating case until roots are emitted. Several may be inserted around the edges of a pot, but they should be each given a receptacle to itself when well rooted.

A quite cool house will grow the plants well when they are established, and they may be pinched into any shape desired. Syringings are helpful in promoting growth and keeping down red spider, which sometimes attacks plants in hot, dry places. A light, sandy loam suits this Eurya very well, but many growers give it peat in order to save frequent repotting, and increase the variegation of the leaves.

Regis.

* * *

NUTRITIVE BANANAS.

Alexander Von Humboldt estimated that a banana plantation will feed 25 human beings where a potato field of the same size would support but two, and a wheat farm only one. He also ascertained that chestnut groves, with full-grown trees, produce six times as much food per acre as any cereal crop. In view of these facts it has been suggested, says the "Family Doctor," that a time may come when the staples of human food will be mainly derived from trees, greatly to the advantage of the race.

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The * Orchard.

OPERATIONS FOR MAY.

Given favorable weather conditions, a sufficiency, not a super-abundance, of rain to render the soil in fit condition, the operation of planting should be in full swing during this month. Only in wet, cold districts is it advisable to delay planting until spring. The soil being both warm and moist, the roots will take kindly to their new quarters, and will go on forming before the depth of winter overtakes them.

Assuming that the soil has been thoroughly cultivated, and that the grower has made a study of his area, that he is familiar with all the varying nature of his soil, and the variety of sites and aspects his orchard offers. Assuming, too, that he has some acquaintance with the individual tastes and predilections of the subjects he is about to plant to guide him in the matter of their disposal, we can pass on to a few suggestions connected with the all important matter of planting fruit trees. Choose in the first instance healthy, straight-stemmed young trees, neither overgrown nor stunted, with a good root system, and every indication of healthy development. The roots must on no account be allowed to become dry, the trees should, therefore, not be lifted too soon. They must not be exposed to the air whilst awaiting their turn to be planted, but should be protected by straw or hessian. Damaged and broken roots should be cut back with a sharp clean cut to a healthy part, which will induce new growth to spring. Every plant should have a perfect wreath of roots. As we desire the headgrowth to be perfectly symmetrical, so we must ensure an equal distribution of the roots. Avoid crowding them all in one direction. The few main roots should spring at regular distances from the base of the trunk, and the fibrous growth should be evenly disposed between. Carefully disentangle the roots if at all matted, and spread out in layers to their full extent. If the tree has come from the nursery with a faulty root system, give the side deficient in roots the most favorable aspect, and do everything to encourage an equal growth.

The hole in which they are placed must be wider than the length of the roots to allow of their being spread out to their full extent. The bottom of the hole should be convex so that when the tree is placed on the slight elevation in the centre, the roots will have a gentle inclination downwards. Each layer of roots should be covered with a layer of light soil. Care should be taken not to throw it in heavily and so to jam the roots, but with just a light sprinkle to sift through and fill in the interstices. This soil should be brought for the purpose, and should be a light loam combined with vegetable mould and wood ashes. When covered make the soil firm, but do not tread if inclined to be at all heavy and stiff.

The soil mark on the stem is generally a good guide as to the depth at which the young tree should be planted. The top layer of roots should not be covered with more than an inch or two of soil. Young trees want careful staking, as they are liable to injury if blown about by rough winds. The stake should be driven in before planting, and the base dipped in creosote or tar.

Prune the head of the tree as well as the roots before planting, and give the weaker side the more favorable aspect. Three or four well disposed shoots are sufficient to form the foundation of a symmetrical and profitable head.

In planting a new orchard the square style is the most economical and satisfactory to adopt. The distance apart at which trees should be planted naturally varies according to the nature of the soil and the native habit of the tree. We have to consider the breadth and height to which a tree will attain under given conditions, the necessity of a free admission of light and air and of facilitating cultural operations. If a tree spreads twelve feet —that is, six feet each way from the trunk, eighteen feet should be the minimum distance at which to plant. In the case of pears, plums, apricots, and apples, being somewhat vigorous of growth, from eighteen to twenty-four feet should be the distance. With cherries, quinces, and peaches, from sixteen to twenty feet is a good average distance. A free space of six feet at least should be allowed between the extremities of the trees.

The importance of providing a perfect drainage system at this season should be fully realised. The benefits are so obvious. The accumulation of water in the soil excludes air and prevents its mineral ingredients being assimilated by the plants. Moreover, the heat from the sun, instead of warming the soil and promoting growth, has to expend all its precious powers on evaporation. Where drainage is provided the rain is enabled to pass freely through the soil, and with it air and several beneficial gases. The system of drainage depends upon the nature of the soil and the class of crops. In a cold, wet district and a heavy soil deep drains are best, as the soil is then partially dried and warmed to a greater depth. From three to four feet is a fair average depth. They may be placed forty feet apart, or from four to eight drains to the acre. Earthenware cylinder pipes are the most durable; these should be packed, so to speak, in brush wood or stone rubble to prevent them being choked by silt. If the land has been well graded draining is considerably facilitated. One must, before deciding on a system, consider the contour of the land, take the highest and lowest levels, choose the lowest point for the outlet, and ascertain the best gradient. A sufficient fall should be provided to enable the drains to clear themselves easily. Drains should not run up and down, but across hill sides. Orchard soils should now be so cultivated and arranged as to throw off moisture and to attract the sun's rays. No weeds, fallen leaves, or mulch should be allowed to lie about the surface.

In addition to planting young trees, many established subjects can be transplanted or removed always provided it is effected with the utmost care. Pears, plums, peaches, and apricots will all bear removal if their roots are not hacked about or otherwise injured. Of course, this treatment does not apply to old established trees, but to those in the first years of their existence. Apples and cherries cannot be transferred, they resent such a disturbance of their roots.

FRUIT.

Pruning and planting may be gone on with this month, as soon as the leaves have fallen. After pruning the trees should have a spraying with some insecticide. Gooseberries, currants, and raspberries should have a coat of rotted manure dug in, and a fork should be used in digging.

HISTORY OF THE TURNIP.

This vegetable was cultivated by the ancient Greeks, and after them by the Romans, among whom it was used as a food for slaves and cattle; and it was also presented at the tables of the wealthy, dyed in at least one of six different colors. These people were thoroughly conversant with the requirements of the plant, for which they cultivated the soil with a carefulness unattempted in modern times, and made use of the seeds, the foliage, and the bulbs with discrimination. A curious superstition is mentioned by Pliny as having been practised by those who sowed the seeds. They performed the operation while in a nude condition, meanwhile praying that the turnips might grow for themselves and their neighbors; it was a Roman custom that anyone could help himself to turnips from his neighbor's field, just as in the north of England and in Scotland it was till quite recently permitted to anyone to enter a field of turnips and eat one, but it was illegal to carry the root away. The Welsh people at one time ate largely of raw turnips. The foliage was boiled in pottage. The stalks in spring were stretched, and after being cut into suitable lengths and peeled, were cooked as a substitute for asparagus. A not uncommon way of preparing the roots was to wrap them in a piece of paper, to be placed under the glowing embers till roasted, afterwards eating them with sugar and butter. The seed leaves of the turnip are sometimes used in the same way as mustard as a salad. —"Australasian."

Vegetable Garden.

OPERATIONS FOR MAY.

With plentiful rain and intervening spells of fine weather during this month a favorable opportunity is offered for getting forward with the work in this department.

Beds from which crops have recently been cleared away should be well dug, have a heavy dressing of manure, if necessary, for the succeeding crop, and should be thrown up rough to enable them to benefit from full exposure to the weather until the time for planting arrives.

Sowings can be made of broad beans, silver beet, carrots, turnips, endives, lettuce, onions, parsley, spinach, and early, medium, and late varieties of peas.

Cabbage, cauliflower, lettuce, horse radish, herbs, and rhubarb roots that are ready can now be planted out in favorable weather. Keep the necessity of rotating crops well in mind for the better economy of the food stuffs in the soil. A crop of beans, for instance, should never be succeeded by a crop of beans. The plants of one family,having to a certain extent tastes in common, should only be succeeded by those of an entirely different family and character. An exact method of rotation should be worked out and strictly followed. Potatoes, as is well known, require a rich, well manured soil, and can, therefore, be followed by peas, beans, carrots, turnips, or cabbages, the same soil sufficing for them without further enriching. They in their turn should be succeeded by vegetables of dissimiliar tastes.

The main point in rotating crops successfully is to make a study of the various tastes of the different subjects in order to be able, at the time of planting, to substitute one crop for another of a totally different capacity.

Clear away all refuse, exhausted vegetable crops, and all untidy matter to the rubbish pits, there to rot down and form soil for future crops.

Celery sufficiently advanced should be blanched by earthing up four or five weeks previous to its being required for the table.

CELERY.

Celery has been not inaptly described as the most gentlemanly of all the salad herbs, and at its best it is perhaps deserving of the compliment. It shows unmistakeable signs of good breeding and cultivation, and when daintily crisp and "nutty" its alliance with the Stilton is beyond reproach. This, however, is to take the herb on its social footing; but it has other and weightier claims to respectful recognition. Few edible plants better repay attention; and to the amateur gardener who prefers the useful to the ornamental his celery is hardly less a pride than a delight. The early sowing of the seed; the tender pricking out of the pushing young things and their removal to temporary premises; the transplanting of the more robust in the carefully prepared trenches. And then the digging of those same trenches! That is a feat which has surely received the domestic commendations it so well deserved. Perhaps it looks harder work than it really is, but the carefully raised banks of earth make a capital show. Even now, however, the keenest pleasure of all is to come, and it will make the three summer months run as lightly over the amiable culturists' head as if he had his own "acceptance" to meet at the end of them. Which, happily, in this innocent form of recreation, is never needed. The inspiring process known as "earthing up the celery" will occupy the gardener during the greater part of the summer. He takes it in easy stages, and by the time he has finished the last row, it is time to begin again on the first. And that he has been engaged in "earthing up the celery" is an impeachment which the most sensitive amateur is always ready to admit without a blush.

But it is necessary to admit that the delicate white celery which results from this pleasant series of operations is of very humble origin. The wild celery, or "smallage" is to be found in most temperate climates. It was once plentiful enough in England, and the Isle of Thanet and the meadows bordering the Trent were almost over-run with it. The famous Marshal Tallart, brought as a prisoner of war to England in 1704, resided for some years at Nottingham, and the introduction of celery into this country has been placed to his credit in the ill-audited books of post-humous fame. It may be admitted that, to enhance the attractions of the "elegant table" at which he was accustomed to entertain the neighboring gentry, the Marshal "procured celery to be sent him from abroad." But this is in no sense an implication that celery was not then produced in England. As a matter of fact, it was fairly common, though no doubt it was as yet inferior to that imported from Flanders. John Evelyn informs his readers how "smallage and celery are to be sown in the month of March;" while from a work written by a nephew of John Milton in 1678, we learn that "Sellerie is an herb which, nursed up in a hot-bed and afterwards transplanted into rich ground, is usually whited for an excellent winter sallad." Such a precise description must have been founded on experience; and it is quite clear that celery was grown and "earthed up" in England long before the enforced sojourn here of its so-called introducer. Other authorities tell us that it was first cultivated in Italy, and some support is given to this idea by the often-recurring item in old lists of plants—"upright Italian celery." Some of the Italian varieties are still occasionally seen in England, but the Italians care little about "blanching" their celery. Nor, for that matter, do the Germans or the French. It is as an ingredient of soups and stews that the esculent is chiefly esteemed on the Continent, and the unbleached plant is certainly of more powerful flavor.

It has been long recognised by the chefs—and even our own "plain cooks" follow suit herein—that celery is absolutely indispensable in the kitchen. As one of the great masters of the art pathetically inquires, "What would become of all my soups, sauces, and entremets without celery?" We leave him to his own solution of that problem, finding enough to wonder at in the neglect of celery as a cooking vegetable among ourselves. Scores of authorities on the culinary art have insisted on the advantages of celery cooked, as opposed to celery raw. But what a loss is there in the presentment of celery at table in the guise of a sauce, in which we have almost invariably to take the word for the flavor. Both epicures and moralists would experience a grateful glow of appreciation if the traditional imposture known as "celery sauce" were at last to be superseded by the real thing. Recipes abound, but here is one of approved simplicity which has not been surpassed by anything more novel and intricate. "Wash six heads of celery. Halve or leave them whole, according to size, and cut into lengths of four inches. Put them into a stewpan with a cup of thin white gravy, and stew till tender. Then add two teaspoonfuls of cream, a little flour and butter seasoned with pepper, salt, and nutmeg, and simmer for a few minutes all together." But this, the fair critic may object, is not celery sauce at all, but simply stewed celery. Precisely; but it provides a delicious sauce, while you also make sure of the celery, so often unaccountably absent. And there is another way which, as a great artist delicately whispers, is too good for any but discerning palates. It is really in the nature of a "fritter," and is produced by first par-boiling the lengths of celery, and then dipping them in batter and frying quickly in a pan with plenty of good oil. Experienced liners have been known to express their approval of this dish by complacently asking for more; a form which may be taken as the epicure's supreme endorsement of the plat submitted to his judgment. A chop and celery fritters should be an idea worth cultivating. It is, however, one of those simple little combinations which require to be perfectly done.

It should be accepted as an axiom that the best celery procurable is not too good for cooking purposes. Whether it shall be the "Manchester Red" or the "Sandringham White" is a matter of choice. But too often we only get "the celery" with the cheese, while the outsides are thought good enough for the cook. But these are sometimes strong and disagreeable, if not actually injurious. "Smallage," the founder of the modern branch of the family, is a rank and acrid weed, which develops in moist situations a poisonous narcotic principle. Excess of moisture, or insufficient earthing up at the right season, will even now demoralise a whole crop of celery, which at once gives unmistakeable hint of those noxious qualities that have only been conquered by the labors of many generations of gardeners. And the reason is simple enough. The development of the narcotic principle is favored by light and moisture. Without the former, indeed, its secretion becomes almost impossible. Darkness and seasonable dryness, on the other hand, promote the aromatic qualities of the plant. Here we have the whole philosophy of the "earthing up" operation, with which even greater personages than Marshal Tallart—a true lover of gardening—have recreated their minds and hardened their muscles. The little nips and foretastes of frost which come to perfect this delightful esculent are now at hand; but while we appreciate the crisp finishing touches thus bestowed upon our celery, let us not fail to acknowledge our indebtedness to the persevering cultivator who "earthed it up."—Globe.

SCIENTIFIC.

FERTILIZATION OF FLOWERS.

[BY SIGMA.]

II.

CROSS FERTILIZATION.—This part of my subject is the most interesting and instructive, inasmuch as the "devices adopted" by flowers for preventing self-fertilization are truly remarkable and wonderfully ingenious. I have said the "devices adopted" for want of a better term, thereby attributing voluntary conscious actions to flowers. Of course, this is incorrect, but I am sure you will, after seeing a few examples, agree with me that flowers appear at least to be possessed of conscious will power. At the outset let me say that Darwin's theory of evolution as applied to flowers is based on the "survival of the fittest" in this way. Originally flowers fertilised themselves, thus producing degeneracy. Some, perhaps, by chance, were cross-fertilised. These gave rise to strong healthy plants, which survived and maintained the species. Gradually flowers more and more adapted to cross-fertilization were evolved, because more fitted to environment, and hence the ingenious devices of the present day. Self-fertilising flowers are, he asserts, relics of the old forms, and have so far not been evolved sufficiently. On the other hand, Henslow has contraverted all this, and asserts that the cross-fertilizing flowers are the original form. Darwin, he says, was entirely misled by his own experiments, and was illogical. Cross-fertilised plants may for a time thrive and be stronger, but will eventually decline, while self-fertilised ones will improve. Well, you can believe which theory you please, and if anxious to settle the matter in your own mind turn your attention to the literature of the subject.

However, let me direct your attention to a few examples of these devices, and I will endeavour to select instances either among common garden flowers or well-known indigenous ones. In passing, I should advise you not to rest content with a knowledge of the outside appearance of flowers, but on all occasions to carefully dissect them, and note the position of the different organs. Much may thus be learnt about fertilization, and the examination produce a lasting impression. You may be sure that not a hair exists but is of some service to the flower.

Whether self-fertilization is detrimental to the reproduction of healthy plants or not, we find some remarkable instances of devices adopted for preventing it. Let me cite a few.

The stamens may ripen before the stigmatic surfaces become exposed, or vice versa. This, of course, is effectual.

The stamens may be in such a position relatively to the stigma as to render self-pollination an impossibility. For instance, the style may overtop the stamens considerably, and therefore be well out of the way of the pollen. The pistil may be sterile to the pollen of the same flower, as is the case with the Myosotis (Forget-Me-Not). Nearly all flowers hang in such a way that the pollen of those above on the same bush cannot reach the stigma of those below. However, it is absolutely necessary, when self-fertilization is avoided in any way, for the plant to be cross-fertilised, and this is in general brought about by insects which carry the pollen from flower to flower as they search for honey. It may be carried on the head, on the back, on the underside, or on the legs. Not only are plants indispensable to insects, but, as will be seen, insects are absolutely necessary to plants. As flowers became more and more specialised and suited for the insects, so these latter became modified to carry on the work of cross-fertilization. This evolution of insects is interesting, and most conclusive, but is outside the province of this paper.

Insects, as I said, visit flowers for the purpose of procuring honey, the carriage of pollen and fertilization being quite unintentional on their part. It is simply marvellous how pollination is indirectly carried on by insects while seeking their food. Most flowers secrete honey, but it may be in various parts of the flower, and in order to guide the insect to the exact place bright patches of color or strong markings (Nasturtiums) occur. Beetles like yellow, wasps are attracted by reddish brown, bees show a preference for purple or blue. Sham honey glands lose color after fertilization The odor of a flower also serves to attract moths, &c. It will be noticed that strongly scented flowers are inconspicuous in coloration; also that most night-flowering plants have a perfume often not present by day, and are white or pale yellow. Ants and voracious beetles are useless or even destructive, consequently we find hairs and such like appendages fringing the flower to prevent these undesirable guests from entering. Ants especially seem to be disliked by flowers.

As a rule, inconspicuous, regular, and sombre-colored flowers are not fertilised by insects at all. Other methods are resorted to for continuance of the species. Flowers at certain times of the day go to sleep; the corolla closes, and undesirable insects are excluded. This shutting up of the flower seems to take place when honey-eating insects are at home. No doubt flowers also close to prevent the rain washing out the honey, or disturbing the pollen. At night time all flowers shut except those which are visited by night-feeding moths and insects. Wind-fertilised flowers remain open both by day and night, because it is necessary for them to be ready to catch pollen whenever there is a breeze.

We may now proceed to investigate some of the devices adopted to prevent self, and at the same time ensure cross, pollination.

In the common Arum the anthers are situated immediately above the stigmas, and are in the most favorable position for fructification, but the stigmas mature first. Small insects can crawl downwards. A little juice of a sugary nature exuded by the stigmas keeps them alive till the anthers ripen. After these latter have ripened and covered the insects with pollen the hairs dry up and disappear, allowing the prisoners to make their escape, and carry their burden to another flower, passing down which they come in contact with the stigma, there to be again imprisoned till its anthers become ripe and the doors are again opened.

(To be Continued.)

PLANTS FOR SMALL SPACE

The following varieties are recommended by the "Florists' Exchange":—

Geraniums.—Beaute Poitevine, salmon pink; Jean Viaud, pure pink; Frances Perkins, pink; John Doyle, scarlet; and S. A. Nutt, crimson.

Cannas.—Tarrytown, crimson; Mrs. Kate Gray, orange scarlet; Mme. Crozy dwarf, gilt-edged; and Comte de Bouchard, yellow variegated.

Chrysanthemums.—Yellow Eaton, yellow; Timothy Eaton, white; Mrs. Henry Robinson, white; Viviand-Morel, pink; and Kate Broomhead, orange.

Carnations.—Lorna, white; Mrs. Thomas W. Lawson, cerise pink; G. H. Crane, scarlet; Governor Roosevelt, crimson; Mrs. G. M. Bradt, variegated; and Genevieve Lord, light pink. If novelties in Carnations were to be purchased, we would name—For crimson, President Roosevelt; scarlet, Flamingo; white, Governor Lowndes; light pink, Alpine Glow; dark pink, Mrs. Theodore Roosevelt; and variegated, Mrs. M. A. Patten.

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The Australian Gardener.

MONDAY, JUNE 1, 1903.

EDITORIAL.

The June issue of "The Australian Gardener' completes the first year of its publication. This being so, we have again to acknowledge the splendid encouragement of numerous testimonials to the worth of the publication. We entered upon the project with the conviction that a gardener's paper of practical service to the cottage, and to the gentleman's estate gardener was much needed in Australia. We have followed as nearly as practicable the lines laid down by the best English publications, and it is no vain boast to say that our readers have acknowledged that there is no other publication of its kind more useful in Australia. On its first issue a number of all wise folk lifted their eyebrows with the expression that the publication would not last three months. We were quite prepared for this reception, and to those who may still have misgivings upon the matter we may advise them that "The Australian Gardener" has come to stay, and continue to fill a place not previously occupied in gardening interests and literature.

To those who wish to advertise in gardening lines, we may say that no better medium exists in the States than the columns of "The Australian Gardener," and the rates are exceedingly low for the returns to be derived. To nurserymen, florists, and warehousemen, we confidently offer the very best medium of advertising their goods, and it is very certain that business men cannot expect to find an outlet for their trade if they do not let gardeners know of their business.

This month's issue deals largely with the ever popular queen of flowers, the Rose, and also with Carnations, which are rapidly coming into popular favour. The nurserymen advise us that the orders for Roses this year have exceeded anything that they have had for years, and a reference to our articles will supply all the latest information required upon the matter of the best selection of varieties.

We again offer our best thanks to contributors and readers for their splendid support to the publication during the first year of our existence. We consider the publication now well established.

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"The Australian Gardener."

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PER YEAR

The Flower Garden.

OPERATIONS FOR JUNE.

The work in this department is of a purely routine character, and there is little to add to the advice given in recent issues. Digging, trenching, shaping, remodelling, and reforming flower beds and borders, renewing and enriching the soil, and a general overhauling of every part of the garden is the principal work to be done. Plants are for the most part in a dormant state, and are able to bear with removal, so that many reforms can be safely undertaken. Better positions can be allotted to subjects unsuitably placed or where better effects can be obtained by the transference. Many large gardens manage to accumulate a lot of rubbishy trees and shrubs, which, of course, in the first instance, were intended to be ornamental, but through injudicious grouping and crowding become unsightly and diseased, and prejudice the healthy appearance of handsomer plants. These should be remorselessly banished. Crowding is a fatal mistake with ornamental trees and shrubs, especially where form and outline is their principal merit. Every subject should have the opportunity of developing its characteristic habit of growth without being forced into unnatural and fantastic shape by close contact with its neighbor. Scale and other pests are always rampant where light and air and rain are excluded. Rose pruning can commence this month where early growth and bloom are desired.

Many deciduous climbing plants and shrubs require their annual pruning or thinning at this season; a knowledge and observation of their habit of growth is first necessary. Some of the Tecomas, T. Mackenni, for example, are benefited by being barbered after flowering. While, on the other hand, subjects like Forsytheas, Deutzias, Weigelias, and Philadelphus flower on the wood of the preceding year's growth, and, therefore, require careful pruning. It chiefly consists in the removal of old, weak, and exhausted wood and a little thinning. Only in cases where plants are known to bear their flowers on wood of the same season's growth can severe pruning be practised.

Above all, avoid trimming all shrubs after the same pattern. Each has a graceful outline more or less peculiar to itself, and this charm of individuality in the plant is rather to be encouraged, rather to be accentuated than destroyed.

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The Fern Garden.

The garden is not quite complete without somewhere, partially concealed by creepers, in the coolest, shadiest, portion of the ground, is found a fern garden. It is just the finishing touch. Without its presence there is something to be desired, with it our sense of joy and satisfaction in the garden should be well nigh complete. It affords a cool, delicious retreat from the noon-day glare, from the hot sun, from the boisterous winds. We cannot quite exclude these from our flower garden; they dodge the trees and the creepers, and make their disturbing, inharmonious presence felt. In the ideal fernery there should be none of these. It should be peaceful, restful, the twilight after the glare, and just a suspicion of gloom, the gloom of the forest depths and a stillness like that "before the winds were made." The sunlight must just filter through the leafage above. The air should be moisture-laden, soft, and misty. The wind must be tempered to the fern. The clustering creepers are the custodians of the treasure house, and they contend among themselves for the office. By their order and interference the wind transforms itself into a gentle breeze, which softly caresses and kisses the ferns that sway and ripple responsive to its touch.

There is such variety, too, infinite variety in the form and color of the ferns. We realise what variations and gradations that wonderful color is capable of, and the innumerable changes nature can ring on her universal green. The supreme achievement of a fern is its frond. All its wonderful, mysterious powers are concentrated on that effort, and what other miracle in nature can compare with the peculiar grace and beauty of this unique production. When we watch Nature's processes as exemplified in the fern, when we investigate its most subtle and mysterious methods of reproduction, we are in wonderland. Even if we are not susceptible to the beauty and refinement of the fern, we cannot remain quite adamant to its associations. It is the connecting link that binds us to its native home. It brings with it a sense of repose, a suggestion of that world of moisture and shadow, of soft perfumed vapors, trickling, purling streams—that secluded fairy-like world whence it comes. It is the special prerogative of the fern to look and fresh. Its fronds are the coolest of greens. It never launches out into gay colors, but occasionally varies its tints with a delicate silver variegation or the richness of gold. If we create a little fern world in our garden we are brought into more immediate touch with nature's fern world beyond, and we cannot seek the seclusion of the fernery, with its miniature gullies, its moist atmosphere, and the ferny forms, without recalling similar scenes on a grander and more lavish scale to which we are indebted for many a hint and suggestion.

Ferns it would seem are naturally artistic in their tastes, for they almost invariably elect to grow where nature is loveliest and most attractive. Even where she is wild and rugged in her aspect they are there, as it were, to tame her mood, to soften and round off her jagged outlines, and to present one of those sharp contrasts so satisfying to the artistic sense. But they love better the mountain gully, where the water trickles at their feet, splashing and bedewing them as it gushes past, the depth of the greenwood shade, Nature's dreamy solitudes, where there is partial gloom and everlasting repose, or where they are lost amid a wealth of tropic vegetation, where heat and humidity afford an ideal environment and give them a delicacy of form and texture and a brilliancy of coloring not attainable elsewhere. In such places they grow to perfection and multiply their kind, adapting themselves so to varying positions that no portion remains unclothed. So diverse are their tastes and predilections that they will distribute themselves freely wherever a deposit of leaf mould offers them an abode or means of sustenance, between the forks of the trees, on the rocks, at the foot of the rocks, in the crevices, on the slope of a mound, or the bank of a stream.

In the foregoing remarks we have sought not only to appreciate the fern, but to convey a hint as to its treatment and disposal in the fern garden. It is far better to be one's own fern collector as far as possible, for then one has the opportunity of noting the conditions under which it grows, and a visit to a fern gully is the best possible guide in the formation of a fernery. The picturesque irregularities, the variety of form in these places, and the observation how in nature every loss is made to subserve the gain of another form of vegetation, are all interesting and instructive in the extreme. The lifeless trunk of a tree that has fallen across the stream becomes a bed of ferns, and every plant in the gully is revelling in generations of mould, the result of former vegetation.

In constructing a fern garden it should be borne in mind that the essentials to their healthy growth are shade, moisture, a certain degree of warmth, good drainage, and a variety of positions to suit their varying tastes. The sides of the structure, especially those more exposed to the sun and wind, should be clothed with fairly compact evergreen creepers, but not so dense as to completely exclude the air. Deciduous creepers should form a light canopy over the top, letting in only the requisite amount of sunlight and air, as the lacy branches of the forest trees do in their native homes. Overarching trees have an advantage over creepers, unless the roof of the structure be very lofty, because of the dome-like space they afford for the free play of light and air. The annual fall of leaves from these trees will supply the soil with a natural mulch, and a rich accumulation of leaf mould should result. Where this does not naturally occur a top-dressing of leaf mould should be applied, at least once a year.

All beds prepared for ferns should have a depth of at least two feet of rich mould and a small proportion of sand. Sloping beds, banks, mounds, and rockwork will ensure good drainage. A level, even surface is not desirable for a fernery; it is unsuitable to ferns, and utterly ineffective. The transition from flower garden to fern garden need not be too sudden; a few of the hardier ferns can mingle with the flowers outside as a gentle prelude. Arrange the entrance so that it commands the most extensive and effective view. The ground should incline gradually upwards towards the back, so that tier upon tier of ferns will rise one above the other in imposing array. A rise of only 4 or 5 ft. in a small area, provided tree ferns and other tall growing varieties are judiciously grouped at the rear, will give an impressive appearance of height. Clay, stones, rocks, or any rough stuff obtainable can be used as the foundation; to bank it up and over this 2 ft. of leaf mould should be laid. Better effects can be obtained if the fernery is oblong, and if it is square the main lines should run from corner to corner, thus giving a greater length and better effect to the view. There should be no more paths than convenience actually requires, and these should be rendered as informal as possible. The principal path may run from the entrance the length of the fern garden, winding slightly about among the ferns, only here and there visible, and nowhere obtrusive.

Water is an inseparable associate of the fern. Therefore, if a trickling stream of water can be arranged with the aid of rocks to simulate the waterfall in a mountain gully so much the better. It will enhance the effect, render the atmosphere more permanently moist, and make the illusion more complete. Rocks should enter largely into the construction of a fernery, especially those of a soft absorbent character, as they are always storing up moisture and giving it forth again by gentle evaporation. More variety and pleasing irregularity can be obtained with rocks than almost anything else, and the crevices and interstices afford an ideal home for the little fern. Care should be taken to provide a sufficient body of soil in the rocky crevices. Tychopodium and the hardier Adiantums will clothe the soil at their base and carpet every space where leaf mould and moisture offer an inducement to remain. The walls of the structure should be masked and concealed from view by trailing creepers and Asparagus fern, of which there are now so many beautiful and hardy varieties, and also by numerous Elk's Horn ferns and Stag's Horn ferns (Platycerium). We do not want to be confronted by and continually reminded of these material limitations. We prefer to use our imaginations as to what lies beyond. Any posts or supports should be similarly clothed. Old tree fern stumps, if they can be procured, should be made abundant use of. They serve excellently for terracing when placed horizontally as receptacles for ferns and lycopods, as these revel in the rotting mould and fibre.

Consider in disposing of ferns their individual predilections, whether they would court the darkness and moisture of a hollow or prefer its margin, or whether they would invite exposure on a knoll. To suit all tastes let there be sloping banks and shady hollows, miniature gullies, rocky crevices, and putting knolls. Most ferns prefer a slight elevation, for though they have an affinity for moisture they do not like it permanently at their roots.

There are ferns whose graceful forms we would wish to see from top to base. Let them, therefore, rise above the rest, and on a tall stump or a rocky eminence display their noble lines to the best advantage. The Harefoot ferns (Davallia) are among those that demand an eminence, and so that the beautiful silvery Rhiyomes can be duly appreciated as they droop gracefully downwards. This will also ensure good drainage, one of the essentials to their growth. Hanging baskets distinctly add to the appearance of a fernery. The drooping varieties of Asparagus fern, that have something the effect of a delicate green veil, are eminently suited to this purpose; so also are the Alpine Strawberries, hardy Adiantums, Pteris Scaberulæ, Polypodium rugulosum, Niphobolus lingua, and others. They should be encouraged with an occasional renewal of the soil and regular supplies of liquid manure to make a luxuriant growth, and thus, as it were, to form an aerial garden. Let them be suspended at different heights, so that there will be no stiff uniformity in their arrangement. Wherever the eye wanders it must rest on ferns.

The following is a list of ferns suited to this semi-open air culture. Besides tree ferns, of which there are many beautiful and effective varieties and hardy Adiantums, there are the Pteris family, forming an ornamental and varied group, viz., P. incisa, P. ouvran, P. scarerula, P. serrulata, P. tremula, P. argyrea (the latter one of the few hardy variegated ferns), Struttioteris Germanica, Woodwardia Japonica, W. radicans, W. christata. The last three are strong growing, handsome ferns, which will even bear with rough treatment. They produce an abundance of off-sets, and are, therefore, easily propagated. The Bird's Nest fern (Asplenium andeyianum nidus) is distinctly handsome, growing to a great size, and with its rich green burnished fronds is a conspicuous feature. Asplenium obtusatum, Anthyrium felix fæmina christatem, the well-known lady fern, of a delicate shade of green and feathery form. It should have abundant moisture and a rich peaty soil. Blechnium polypoidoides and B. spicant, the latter known as the hard fern, is another variety that wants a moist peaty soil. It should share with Osmunda regalis a most peaty hollow. Cyrtomium atratum, Davaillia dubia, Dictogramma Japonica variegata, Diplayium Thwaitesii. Doodia candata, with its succession of pretty young pink fronds; Thlebodium aureum; Lastrea filex-mas cristata, the male fern, is exceedingly handsome; and with T. erythropus wants mellow loam or peat and a shady position. Tomarias should be grown in abundance. They are very hardy and quite indispensable; their fronds have always the fresh, glossy appearance of young growth. The crested varieties are becoming rare, but if obtainable are very choice, having that rare distinction that crested growth alone can give. Microlepia elegans. Niphobolus lingua should be placed on an exposed elevation. It wants a rather sunny position and a soil composed mainly of brick and sand. It should never be allowed to suffer from excess of water. Onoclea sensibilis, on the contrary, should be given a damp place. With Microlepia elegans we will close what must necessarily be but an incomplete list of desirable subjects for the fern garden.

MISTLETOE.

There is something strangely attractive about this curious plant, something mysterious that rouses the imagination. It is attractive, and yet at the same time slightly repellent, for it has somewhat of a vampire nature, in that it sucks out and lives upon the life-blood of some honest tree. Moreover, it is both ugly and pleasant to see, for it hangs in rather ungainly bunches and masses, and yet is beautiful in detail. In form it is so simply constructed that it gives one the impression of being low in the scale of vegetable creation. It is built almost as simply as a seaweed, but there is a strange and rare kind of beauty in the individual twigs, and especially in the relation of color between the golden-green leaf and the pearl-white berry.

The seed can be sown by fixing the berry either in an artificial slit, or a crack in the bark of any likely tree, preferably on the underside of a branch. Such sowings are often ineffectual because the seed is used before it is ripe.—"The Garden."

AN EXOTIC LILY.

An exotic Lily from the East, a very curious plant, can now be obtained in England. It requires neither water nor earth, gradually produces leaves, and even blossoms apparently without extraneous assistance of any kind. It is extremely interesting to watch its development, and adds another novelty to the collection of bulbs for the sitting room. The Japanese Lily in the china bowl among pretty little pebbles was a charming joy, but this plant is still more curious and absorbing.—"Graphic."

Autumn Tints.

The tinted foliage of our gardens, so charming to the landscape pictures of scenery, is fast fading away, and little now remains but naked branches to relieve the dull monotony of sombre evergreen. But we cannot allow the beauty of this transformation scene to pass without a record. To this end a little excursion was made to the hills, where the glory of autumn is seen at its best. No sooner had the train reached the higher altitudes than a peep from the windows disclosed the golden hues of orchards. These were pretty enough as a relief against the surroundings of eucalyptus and the undergrowth, relieved here and there by patches of the red Epacris. Alighting from the train at Mount Lofty a peep from the road is obtained of the garden of "St. Vigean's," and surely no flowers could ever render a more artistic effect than the tints of autumn here. We first halt upon a zigzag path leading up the hill towards the house, and take a record of a few settings of coloring to make a picture. Here the photographic artist fails to reproduce the beauty, and words are almost equally futile. But those who may be familiar with the trees and shrubs mentioned may get some idea of what is to be seen. We take for the centre of a group a very deep rich copper-colored Prunus pissardi, a shapely tree of full fifteen feet in height, a splendid coloring in itself, enhanced in its beauty by the setting close by of a Draecena Cunninghami, with its long spreading leaves of green. In contrast to this mass are the lighter waving leaves and tall grey plumes of Pampas. By this is yet another contrast of stately broad and tall leaves of Cannas, the rich green made more beautiful by the golden yellow flowers. This part of the right hand side of the central figure is backed by the thickest growth of pines. Now looking to the left of the Prunus copper-color, the eye is caught by a most beautiful tinting of the Liquidamber. Here is a fascinating variation of tints if you will. No artist's brush could ever place upon canvas such shades of coloring as those leaves produce. The prevailing color is a deep red varied in shadings to russets and yellows. Apart from the colorings, the form of the leaves is very attractive. The Cupressus is strongly represented in the garden, and the specimen of Lawsoniana here shows well with its bright lemon-tinted green. In this little group, too, we make first mention of the Rhus Succeedanea, than which there are no more beautiful autumn tints in the whole range of shrubs. Setting off this is the gracefully shaped Draecena Nutans.

Now move up to the next path and take another picture in variation of color. The eye first catches three feet of gold and green immediately in front named Euonymus albus latifolius elegans. The length of the name is only in keeping with the beauty of the plant. Near by a dense bush of Eriostemon nerifolium budding into a mass of white stars adds grace to the varying tints surrounding it. Another Prunus Pissardi is a much lighter copper color than the one first mentioned, and the sun shining through the shimmering leaves is exceedingly pretty. Completing this first row is a dwarf yellowish green Taxus elegantissima, and as a backing of color comes in order a Rhus Succeedanea, beautiful in its deep red and copper, and also one of the prettiest specimens of its kind in the garden, a beautifully shaped Cupressus Lawsoniana erecta viridis. The motion of this tree, answering to the soft zephyr breeze, varying the shades of blueish green, is a charming effect. All this kind of life is lost to the camera, the beauty of the tree dies under the lens. Next comes a different class of coloring and foliage in a Pittosporum nigrescens, with its variegation of light green and creamy white. Peeping through these tintings we catch a glimpse of the beautiful bold purple flowers of the Lasiandra macrantha grandiflora. These flowers make a span of five to six inches across, and look very royal in their velvety damask of moss green foliage. We cannot pass another Liquidamber, a copper green Retinospera ericoides, and a bright green and gold Clethra alnifolia, with its brown tintings, and as we turn the corner the yellow tinted tips of a Retinospera nana aurea leaves its impression of beauty.

As we leave the zig-zag path to wander on the flat, the change of views of the tinted foliage gives additional delight, as does the light and shade of the sun and clouds. We are drawn aside on our way to look at a double native Erica, carefully preserved because of its beauty and rarity. Descending to the flat the water scene arrests attention. Standing on the footpath leading from the back entrance and overlooking the water, we note that the glory of the Rhododendrons has departed, leaving the heavy, sombre green of the foliage. But look at the row of Japanese maples, with their prettily shaped leaves scintillating in the sun, with their varying tints of copper, yellow, and brown—a pretty sight, truly. Across the water is the graceful willow, with its dying yellows, and from this flexible fashion of growth the eye wanders to the stiff, stately flax leaves, in pale green and yellow, of Phormium tenax variegata. Turning again to the left, the magnificent plumage of a Pampas waves in pretty relief between two fine specimens of Draecenas. There is a long row of these, and between each an artistic effect is rendered by species of Rhus, Lambertiana and others of various tints.

Turning now to the hill we get a variety of tints in a row of Elms, Birches, and Oaks, planted alternately, and the autumnal effect is good. Wandering up the paths to the rear of the house we linger here and there to note the hues and tintings of the Cupressus species, and an infinite number of others previously described in our articles upon "St. Vigean's."

"BYTHORNE."

A hedge with a wire fence is all that divides "Bythorne" from "St. Vigean's," and as we enter the grounds the first object of beauty that catches the eye is a great array of rich coloring from Ampelopsis Veitchii, spreading over the white cut stone of the residence. The brilliant red on the northern aspect of the building is a very fine effect, but we were too late to catch the beauty on the southern wall. In these grounds there are a number of effective trees that lend color to the surroundings; but only here and there is attention arrested by a special setting. A mountain ash, known as a Rowan tree, has a lovely burden of red berries with crimson and golden hue in its fading, and this contrasts nicely with the shining silver-leaved Lewcodendron Argentium and far distant. Near the entrance on the left slope of the garden is a nice little picture, containing a Prunus pissardi, Cryptomeria japonica, Pittosporum crassifolium, Picea Nordmaniana, a Maple, and a Birch. In this group we have varying tints of green, purple, gold, and lemon colours. The garden contains a number of splendid specimens that will come into a general description we propose giving later in the season, when the flowers are in their glory.

We now wander away up hill and down dale towards Aldgate, noting by the way fruit trees and willows, and a number of others here and there giving a picturesqueness to the prevailing deep green of the ever abundant eucalypts.

Traversing an up-hill road overlooking Messrs. Smith & Menzel's nursery, and on cutting into the bush at the back of Mr. Michael Hawker's residence, a beautiful little panoramic view is obtained across a deep gully to Mr. Tom Barr Smith's house and garden set on the rising slope beyond. It is a charming picture of autumnal tinting. The distant view is, perhaps, the prettiest, but we needs must venture into closer view of the beauties, and find a splendid collection of English and Japanese Maples which lend the greater portion of the coloring, while the Elms, Oaks, Firs, Pines, Willows, and Poplars intermingle with the giant growths to complete the charm.

From here we climb the hill to Mr. John Bagot's garden, but we are too late, for the best colorings are gone. This garden carries the greatest collection of specialties in the State, and we reserve it for future notice.

OFFICES of

" The Australian Gardener ":

61 Brookman's Building, Grenfell Street,
Adelaide.

Perennials.

HOW TO RAISE THEM.

["The Gardener."]

There are Campanulas suited to all positions in the garden; tiny plants for the rockery, symmetrical plants for the beds, and giants of great beauty for the borders. Certainly we cannot afford to be without Campanulas, so let us raise them from seed, so that we may have them, inexpensively, in large quantity.

I raise all my Campanulas from seeds sown in glass-covered pans of rich, light soil, on a bed of cinder ashes, along a north border. If the pans are sunk in the ashes the earth in them will keep moist longer, and noxious insects, such as slugs, will not be able to crawl across sharp cinders.

The best compost to use is made of good loam, old cow manure, silver sand, and plenty of leaf mould. It is a fancy of mine to add a sprinkling of wood ashes and soot to all the composts used, mixing this in thoroughly before using; it seems to aid the healthiness of the seedlings. The soil must be kept moist, the glass should fit tightly, and no air should be given until the seedlings are up.

July is an excellent month for sowing seed, but any time until the end of August will do. Indeed, from April to August the work may be satisfactorily performed.

The earlier seedlings can safely be pricked out where they are to remain; the later ones should be ready to move in early October, or else must be left where they are until the following March, when puttnig must be done so carefully as not to disturb the roots.

The Peach-leaved Campanula is greatly prized for all purposes for which cut flowers are needed, especially for church decoration. Campanula persicæfolia is its title; the flowers of this are lavender blue, alba being the white variety. There are also Campanula p. alba grandiflora, and C. cœrulea grandiflora, the improved, larger-blossomed sorts, or C. pallida, which carries pale blue flowers.

The Chimney Bellflower, Campanula pyramidalis, is one of the grandest of herbaceous plants. It is a five-footer, and has been known to grow to 8 feet where the soil and situation pleased it! The blue, clustered blossoms appear up all the sides of the noble flower stems. There is a white variety of this also, and a compacta, of deep blue color, for those garden owners, if there can be any, who do not like plants taller than 3 feet.

We all love the English Harebell, do we not? Well, its scientific title is Campanula rotundifolia, so we may grow it by hundreds on our sunny banks, in turf if we prefer, or among the rockery chinks.

Campanula turbinata is either purple or white; it grows only ½ foot high, but the bells, set singly on graceful stalks, are almost as large as the individual blossoms of persicæfolia.

Quite the prettiest of the dwarf Campanulas is carpatica, in lavender blue or white, and the foliage is dainty and fresh looking in the extreme. It makes a beautiful bordering to flower beds.

Campanula attica, deep purple and white, is only a few inches high, while carpatica is 1 foot.

The list of varieties that we may grow from seed is not yet exhausted; next comes C. alliariæfolia, which grows 3 feet high, has spikes of drooping white flowers, and large heart-shaped leaves.

Campanula fragilis and C. garganica are violet-blossomed rockery or basket plants, prostrate in habit, but a quarter of a foot in height. C. latifolia macrantha (3 feet) has fine purple flowers, and loves a damp spot; Campanula mirabilis, from the Caucasus, has pale blue flowers that are especially valuable for cutting (2 feet).

M. HAWTHORNE.

TREES AND SHRUBS.

RHODODENDRONS IN LARGE GROUPS.

[From "The Garden."]

The value of a simple grouping of one good flowering plant or shrub can hardly be too highly rated. It is a lesson of such importance in good gardening, that we desire to take every opportunity of referring to it. A group of Rhododendrons—towering masses of bloom, some 18 ft. high—shows how a noble mass of one thing alone goes to the composing of a satisfying garden picture. It also shows the beneficent service of shrubs of large growth in giving interest to the hard line of a rectangular pool by breaking over it, and boldly insisting on the display of its own unrestrained growth.

For this class of treatment no kinds are better than well-chosen seedlings of R. ponticum. But there are also two good old garden hybrids, namely album grandiflorum and album elegans, that have tall, vigorous growth and abundance of bloom, qualities that befit them for large and pictorially-treated groups, while their color suits admirably with the seedlings of ponticum. But as these vary a good deal in tint, it is well to pick them out in the nursery at blooming time, when it is easy, by taking two blooms in the hand, to go round and assort plants, either for one or two groups of the warmer and cooler shades respectively. The effect is much better, even in a large planting, if one only of these shades of purple is used throughout with the tall growing whites.

Such a grouping would have a fine effect in a rather large space of moist, peaty ground, and it would look all the better for some well-grown groups of Silver Birch.

Lilium Longiflorum

IN JAPAN.

Lilies now form such an important article of commerce in Japan that some of them are grown as a field crop, notably Lilium auratum, L. speciosum, and, lastly, L. longiflorum. The last-named is a universal favorite, as the spotless purity of its large white trumpets, combined with the profusion in which they are borne and their delicious fragrance, all cause it to stand out as one of the most charming of this beautiful class. A breadth of closely-packed blossoms may by some be regarded as monotonous, but even if such is the case, from all points of view it forms a truly imposing feature, that appeals even more strongly to one owing to the fact that nothing like it is ever seen. It is not the ordinary form of L. longiflorum which has been so long grown by the Dutch, but a very superior kind, the flower-tube being longer, while the blossoms are arranged in a more horizontal manner than in the older form. The bulk of those sent here from Japan consist of this kind, and though they are disposed of as L. longiflorum they are really identical with the variety Wilsoni, while the much-talked-of L. Harrisi cannot be distinguished from it if they are grown a few years together under similar conditions. The variety giganteum is a fine bold form of L. longiflorum, remarkable for the number of flowers on a spike. A distinct variety also grown in considerable numbers by the Japanese is Takesima, with longer and less numerous leaves than the other kinds. The most prominent feature, however, is the fact that the base of the stem is of a blackish-brown tint, while the unopened buds are also suffused with the same hue.

The huge numbers of L. longiflorum sent to England every year from Japan are readily disposed of, though it is at least doubtful if more than 1 per cent. of them are planted in the open ground, for it has proved so amenable to pot culture, to forcing, retarding, and so on, that it is possible now to have L. longiflorum in bloom nearly throughout the year. In a cut state nothing is finer for large vases than this, and if taken when the buds are fully developed they will expand beautifully in water. With the love of flowers so deeply inculcated in the Japanese as a nation, it will be no surprise to learn that this Lily holds a high place in popular favor, and during its flowering period it is the subject of much laudation; and no less in our own country than in far-off Japan is the beauty and utility of this charming flower appreciated. With different periods of the year devoted to the honor of the Cherry, Wistaria, Iris, Pæony, Lily, Camellia, and Chrysanthemum, Japan well merits the name of the Flowery Land.—H. P. in "The Garden."

NEATNESS IN THE GARDEN.

["The Gardener."]

Beautiful plants in the greenhouse, brilliant borders in the flower garden, and fine crops of vegetables are all marred if surrounding them there are untidy spots.

There are persons who cannot pot a plant without littering the floor of the shed with crocks and soil. In all cases there is labor expended in procuring the material and using it, but there need not be so much litter made as there often is and then the labor of "cleaning up" would not be so great.

Being quite familiar with the surroundings of a place sometimes blinds the gardener to its defects—defects in the matter of tidiness, I mean; but a stranger at once notices them. After "bedding out" has been completed, empty pots and boxes should not only be put aside tidily, but carefully. Wooden boxes soon rot if they are exposed to the weather day and night; they should be placed in a shed.

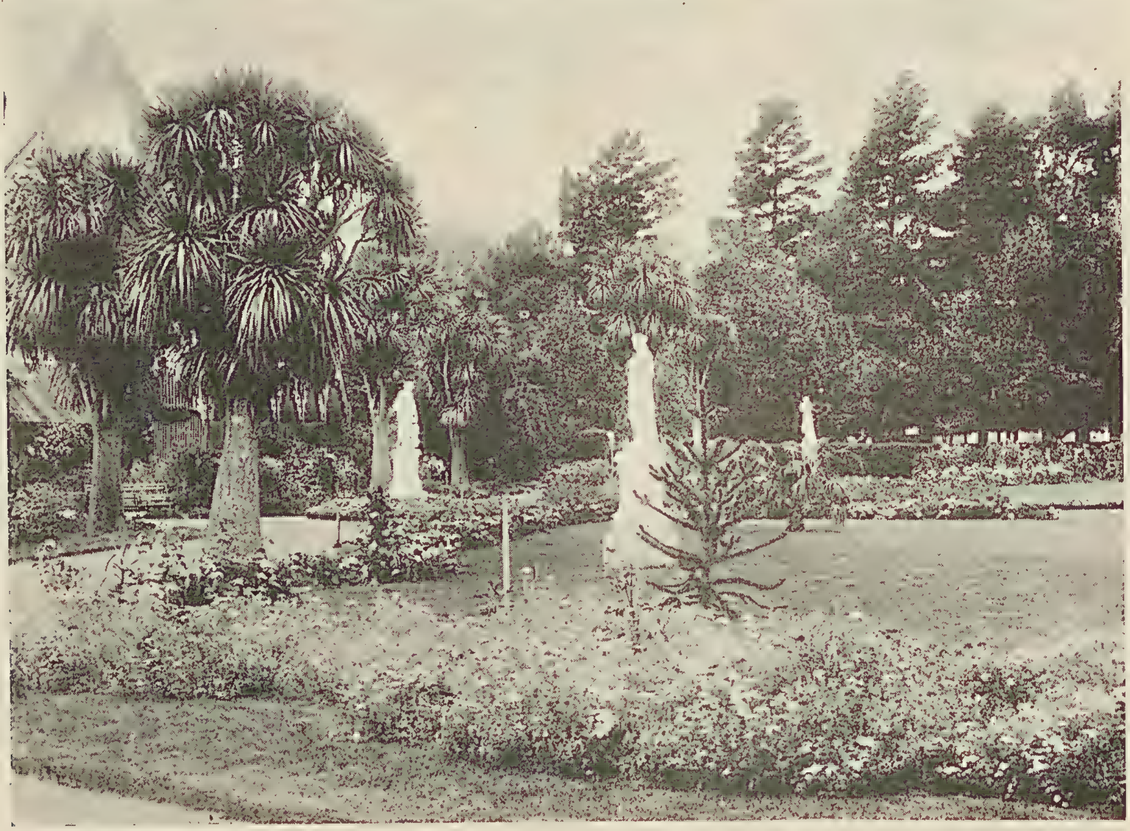
Pots, too, require properly grading; the smaller ones ought to be put inside those just a trifle larger, and not the latter occasionally in the former; moreover, fewer should be telescoped together—twenty 3-inch, twelve 6-inch, three 9-inch, and so on according to size, are sufficient. The placing of long armfuls of pots, the one in the other, and then carrying them crescent shaped from place to place, is a most fruitful cause of cracked and broken pots. Then there are heaps of old potting soil, and crocks, stakes, and pegs, some decayed and some still useful. Pick out the best, tie them up into bundles, and keep them in a dry place. Sift the soil, extracting the rubbish, which will be found useful for making up holes, and put aside the remainder for such purposes as top-dressing herbaceous borders and for covering vegetable seeds with.

Ashes should be sifted, the cinders preserved for the winter stoking, and the fine ashes placed on back paths or spread out and made into a firm bed for standing flower pots on. The cut lawn grass should be relegated to the manure heap or used as a lining (outside) to Cucumber and Melon beds. Weeds and stones which have been taken from the vegetable quarters are best burned and used for filling up holes respectively. Old Pea sticks and flower stakes may be shortened and again made use of. Leaves of vegetables and old stalks must never be allowed to lie about untidily, but should be gathered up regularly and burnt with other rubbish or dug into the spare quarters at once.

The tidiness or otherwise of the conservatory or greenhouse has much to do with the general appearance. Empty pots, stakes, old watering cans, and dead plants are often found lying about under stages. Besides being untidy, these things harbo insects, and the cherished pets in the house suffer through their depredations.

Every part of the house must be clean—floor, stages, and plants; then the latter will look bright and comfortable.

GEO. GARNER.



BALLARAT GARDENS.—Showing Statues "Pomona," "Flora," and "Bacchante," and the Flower Bed in Autumn.

This is a view looking East, showing the statues of "Pomona," "Flora," and "Bacchante," and some fine specimens of "Condylinus Australis," which were planted some 35 years ago. Some few years ago there was a fine avenue of these trees here, but they have died one by one down to the present number. The hedge is Pittosporum.

The further beds consist of Cactus and dwarf white Dahlias, the borders on two sides of the large bed consists of Geraniums (several varieties) intermixed with variegated Abutilous.

The nearer border is of Phlox Drummondi. At the base of the statue of "Flora" (the one on the left) is a beautiful design of variegated foliage and flowering plants. The pines in the distance are on the shore of the lake. The nearer trees—"Quercus suber" and "Quercus Hodgkinsoni" (the evergreen oak)—form a portion of the avenue which runs between the lake frontage and the gardens. The photo. was taken in the Autumn

Answers to Correspondents

"Flower Garden."—All hardy trees and shrubs ought to be in by this month. Plant hardy annuals. Cut down tops of herbacious plants and divide those that are too large. Dig flower borders and beds and plant out hardy annuals. Dig up Dahlias and keep for spring planting.

"Fruit Garden."—Pruning should be got on with as quickly as possible. This is the best month for planting fruit trees, and a mild day should be chosen for the purpose. It is not advisable to prune young trees directly they are planted, better a month or so later.

"Kitchen Garden."—Make successional sowings of peas and broad beans. Earth up celery and cover seakale to force. Thin young crops before they get too big, and keep the ground well stirred amongst them. Dig potatoes as they ripen, and transplant young onions, and sow lettuce and other salading.

"R. W. Young."—The article will be published in our next issue.

"English."—We appreciate your complimentary references to the ideas of such a practical character taken from the English publications on gardening. The ideas themselves are most useful. Any novice in gardening can adapt them to Australian conditions.

"Smeed and Son."—Communicate with the Consul for Japan, the Hon. J. L. Parsons, Adelaide.

"Laurel."—Yes, the Laurel will do well on the Adelaide plains for hedging. We know of nothing that looks prettier. It must be cut well back in its earlier growth to make it furnish out well at the bottom. It is a mistake to allow hedge plants to gain much height before clipping. They make too much wood, and can never be trained to look well afterwards.

"Begonias."—Tuberous Begonias can be propagated from seed. Shallow boxes should be half filled with broken crocks. Upon these, place an inch of fine compost, composed of rotten sods, leaf mold, and sharp sand. Moisten the soil and scatter the seeds quite thickly. Cover with a fine layer of sphagnum and fine sand. Place a piece of glass or paper over the box in the sun, and a slight bottom heat. As soon as the second leaves appear, prick them out into a compost of leaf mold, cow manure and sand.

"Carnation" writes suggesting that the newly-formed society in Adelaide should publish their proceedings. We shall be very pleased to insert any reports of a practical nature that may be furnished.

To Our Subscribers.—The year's subscription in advance from July 1 should be paid this month. We shall be pleased to book any number of new subscribers for the coming year for 3s. 6d.

FLOWERS IN GRASS.

[From "The Garden."]

From very early days it has been the practice to grow the commoner kinds of double and single Narcissus in meadows and orchards; and within a recent period most of the rarer kinds have been found to prefer grass-land to cultivated ground, and with the best possible effect; but so far as my observation has gone, with the exception of Snowdrops and Crocuses, the Narcissus stands nearly alone. This seems to me a mistake. There are many other flowers of equal beauty and perfectly adapted to similar localities. I might instance the blue, pink, and white Spanish Harebells, Scilla italica, Snowflakes, and, perhaps, Columbines of different colors; and, when the grass is not very rank, I have found Scilla præcox and S. bifolia, Chionodoxa, Muscari, and hardy Cyclamen to do well. Perhaps, above all, the chequered and white Fritillaries give most satisfaction. Many of the Alliums are very beautiful, but too dangerous in their increase to be lightly introduced; Colchicums are very suitable, where cattle are not likely to be poisoned by them. I have found both Fritillaries and Cyclamens to increase in the grass, but it has been my practice to keep a seed-bed of each annually in the kitchen garden, and to plant out the second or third year. If it be a fact, that to gather a Fritillary flower is to kill the plant, the seed-bed will allow you to gather some of the flowers, and yet keep up the stock. Both kinds are equally graceful, but, for effect in the meadow, the white should predominate.

I have always been anxious to naturalise the Sternbergias, especially S. angustifolia; both flower very fully in the garden, but in the grass a solitary bloom has been my only reward; they require sun at the root. I have also tried one English Tulip (T. sylvestris), which flowers freely in North Wales (one of its natural habitats), but I have had no success; it thrives, but does not flower. Even in the garden it does not flower very fully, not to be compared with its very near relative, Tulipa fragrans; and from its stoloniferous habit it becomes a troublesome nuisance, springing up where it is not wanted, in the midst of other plants.

If any of your readers are inclined to enliven the unmown spots in their grounds it is not too late to procure the material for the coming season. Among the autumn Crocuses I have found speciosus and nudiflorus the most satisfactory in grass, and least attacked by mice and moles As regards C. nudiflorus, the grass is particularly useful in supporting the long, naked stalks, which in the border are beaten to the earth by the first heavy shower.

T. H. Archer-Hind.

BEAUTIFUL BAMBOOS FOR GARDEN AND GREENHOUSE.

GRACEFUL AND USEFUL BUT NEGLECTED PLANTS.

Bambusa.—With a few exceptions the Bambusas are less useful than either the Arundinarias or Phyllostachys. The majority of those in cultivation are of dwarf habit, and are more useful for massing in front of taller subjects, or for fringing the sides of ponds or streams, than for anything else. There are, however, two or three species of imposing appearance which should be in every collection, and these are referred to below. A great deal of confusion has existed in the nomenclature of the species, and many which were at one time known as Bambusa are now included in the closely allied genus Arundinaria. The differences between the two genera are more apparent to the botanist than the gardener, as in general appearance they are very similar. In several of the species the stems are Reed-like, and grow in dense, thicket-like masses. In several the side branches are borne singly from the nodes, not in clusters as in many of the Arundinarias, but this cannot be relied upon as a distinct character. The chief differences between the two genera are in the flowers, and it is rarely that we see these.

B. marmorea.—This is a Japanese plant which is met with occasionally in this country. It grows from 3 to 6 feet in height, according to conditions. It is interesting on account of its thin stems, which are purplish in color, and by the purple sheaths of the young culms, which are prettily mottled with a lighter color. The leaves are small, 3 to 4 inches long, and ½-inch wide.

B. palmata.—Of the whole set of hardy Bamboos this is one of the handsomest. It is a native of Japan and grows to a height of 8 feet. The stems are slender and reedlike, and bear handsome leaves, from 9 inches to 1 foot long and 3 inches wide. The side branches are few in number, one only appearing from each node. It is a quick grower and soon forms a very large mass of bold and striking appearance.
represented by this, and for general pur-

B. pygmæa.—The dwarf species are well poses it may be considered the most useful. It grows from 12 to 18 inches in height, and quickly forms a large mass. It is improved by being cut down to the ground, in May, every other year.

B. quadrangularis.—A distinct Bamboo by reason of its four angled stems. Although it lives out of doors at Kew, it cannot be said to thrive satisfactorily.

B. tessellata.—Though shorter in stature than palmata, this bears some resemblance to that species. It may, however, be distinguished by its larger leaves. It grows 3 to 4 feet high, and the leaves are often 13 inches long and 4 inches wide.

Other species in cultivation are angustifolia, disticha, metallica, and Nagashima.

D. L. More.

Chrysanthemums.

NEW SOUTH WALES NOTES.

The annual Chrysanthemum Show of the Horticultural Society of New South Wales was attended by a large number of visitors. The exhibitors achieved a distinct success over a set of adverse conditions unique in the history of the society. Everyone who grows this flower knows how essential an adequate supply of moisture is to plants in their early stages, and will, therefore, appreciate the tax upon the efforts of growers the shortage of water under which Sydney struggled for so long must have been. Therefore, the display of blooms yesterday was a pleasant surprise, whether regarded from the aspect of variety or quality. Indeed, although some held that the show did not come up to expectations, the opinion must have been influenced by anticipations of something immeasurably better than we have had in the past. Curiously enough, it cannot be said that the Roses which should not have been so much affected as the Chrysanthemums, did not come out of the ordeal so well. There were some superb blooms, unquestionably; but, taken all round, they told of the stress of circumstances the more abundantly. The gorgeous Gladioli, however, defied all adverse conditions, and the display made by Messrs. Anderson & Co. was in itself a sight worth paying the entrance fee to gloat over. The Botanic Gardens made, as is usual, a magnificent display of hothouse plants, but even their glory did not deaden enthusiasm for an exhibit of pot plants made by Mr. Nicol, gardener to Mr. Hugh Dixson. In all these shows the table decoration is a popular feature, and in awarding first prize to Miss Gates for her setting, the judges showed taste that was generally endorsed. Comtesse de la Barthe Roses predominated, and their charming pink was exquisitely contrasted with ruddy brown autumn leaves blended with the green of the selected Adiantums. Some of the displays mentioned were non-competitive. The show was officially opened by Lady Tennyson, who was accompanied by Mrs. Cecil Boyle, and attended by Lord Richard Nevill, A.D.C. The party was received by Dr. Hay, Messrs. Hugh Dixson, and F. Gannan, (Vice-Presidents); Messrs. Zouch, Horton, Kerslake, and Timms, and other members of the Council; and Messrs. J. R. Yorke and H. H. B. Bradley (Hon. Secretaries). After Her Excellency had opened the Show, she was presented by Dr. Hay with an artistic shower bouquet arranged by Miss Gates. Lady Tennyson showed herself a lover of flowers, and her great regret was that ordinary results were not up to show standard.

THE CAVE TROPHY, ADELAIDE. [Kindly lent by the Proprietors of the "Advertiser."]

The third annual Show of the Neutral Bay Horticultural Society, opened by Mr. Dugald Thomson, M.H.R., was a success in every way. There was an exceptionally fine display of Cactus Dahlias, 150 blooms, staged by Mr. C. N. D. Richardson, which received the Society's certificate. Mr. S. H. Robertson made an excellent non-competitive display of Ferns and Palms, intermingled with hothouse plants. This also received the Society's certificate. For the champion Rose of the show, Mr. A. R. Harrison beat all comers with a magnificent specimen of White Maman Cochet, this bloom being selected from amongst the members' exhibits. There was a large attendance, and Messrs. Sayers, Roberts, Leplastrier, Green, and Ferguson carried out the duties of judges in their usual able manner. The following were recipients of first prizes:—G. Knight, G. Weir, F. N. Camroux, C. N. D. Richardson, Royal Nurseries Co., P. E. Ewington, A. R. Harrison, Mrs. Seaver, W. E. Cook, R. J. Maclean, A. Smith, T. W. Young, J. Knowles, Mrs. Malbon Thompson, Miss F. M. Belbridge, Mrs. R. J. Maclean, L. H. Robertson, G. W. Colley-Priest, Rev. R. H. Waugh, and Mrs. Colley-Priest.

As the result of the recent rains, the

country around Sydney and suburbs has never looked better than it does at present. The orange orchards especially are splendid, the trees vigorous and clean, and the fruit both clean and of good size. The orange tree seems, with seasonable weather, to recover itself wonderfully after a protracted drought. The recent drought left many trees apparently withered up, the bark even wilting on the trunks. They were considered practically dead, and were left standing until rain fell and the ground was more suitable for grubbing them up. But when the rains fell the trees threw out both blossom and leaf in such profusion that it seemed as though they had really been benefited by the enforced rest. In some instances these drought-stricken trees have made such wonderful growth that they cannot be distinguished from the more favored trees. The old trees are the ones that suffered the most.

Just now the florists are making displays of Japanese Maples, the tints of which are superb. I have also noticed many blooms of the large Blue Water Lily. This latter seems to be growing in favor with those who affect that kind of flower. I have not remarked many good specimens of Roses this autumn, and many gardeners comment in a similar strain.

Chrysanthemums are now nearly done, and the recent cold weather will hasten their end. Last week I noticed some splendid specimens in Searl's windows, and this florist informs me that booking is very brisk. Personally, I do not think this flower is as popular as it was seasons ago, but it still retains public favor, the more so in view of the fact that it makes a great display, and that it blooms at a time when other flowers are scarce.

Another flower that is not as popular now as it was years ago is the Camellia. I have some in my own garden, and have never seen them looking better. This plant always makes a handsome shrub, and with a little care repays all trouble.

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SOUTH AUSTRALIA.

In South Australia the Autumn Queen is highly favoured, and the annual show of the S. A. Horticultural and Floricultural Society brought together the finest display of Chrysanthemums ever seen here. It was thought that adverse atmospheric conditions in the early part of the season, and then later on the blight plague, would have depreciated the blooms for show. But growers for show are too careful of their pets to allow anything to interfere with them, and the result was most gratifying. With all their care, however, they have no time for much doctoring to the shape and setting of the blooms, and it is perhaps as well to avoid anything in the way of artificiality that would spoil the naturalness of the bloom.

A good deal of interest was centred in the champion prizes. Our illustration of the Cave and Lewis trophy, consisting of 30 Japanese, 18 large flowering, and 12 Anemone flowered, shows a collection of plants exhibited in the name of Mrs. J. Lipman, that would be difficult to improve upon. They were all good prizetakers in each department. The prize for 36 varieties went to Mr. W. T. Collins, while for 24, Mr. W. Thomas was successful. Last year Mr. H. Dutton finally won the champion prize for a single Japanese bloom, but this year Mr. W. Nicholas staged a magnificent white flower of "Mrs. Weeks," and caught the judges' favour, although the yellow bloom of "Frank Hannaford," showed by Mr. H. Dutton, divided honours in public estimation. The points, however, were in favour of the white.

Many blooms that claimed special attention cannot be noted, but those that could not be passed were specimens of primrose and of white Madame Carnot, white cream Hero of Mafeking, lilac Antoniette Henley, pink Mrs. Barkley, Golden Gate, Success, and Mrs. Tom Rand.

The staging of the exhibits, taken as a whole, was good, although a possible improvement in the grouping of colours might have been studied. A mass of colouring thrown together in a miscellaneous fashion carries dangers of spoiling an exhibit, whatever qualities the individual blooms may have as show flowers. Great care, however, was exercised in having good forms, good colourings, and freedom from weather stain. The only exhibit that suffered from tarnish of travel stain came from Wirrabara, a district over 150 miles distant in the North. It was a great pleasure to see these beauties from a country that carries the impression that nothing short of a desert prevails everywhere. And very good blooms they were too.

Mrs. Schubert's Prize Flowers at Jamestown Show.

It became apparent to the authorities that however showy the Chrysanthemum blooms undoubtedly are for exhibition purpose the shows were waning in popularity. This year a distinct advance was made in putting on the prize list other flowers in season, also fruits. Amongst the other flowers first worthy of mention were Mr. H. M. Giles' Begonias. The size and tinting of these blooms were delightful, and we hope sincerely that such beauty will incite everybody who can command a sheet or two of glass, or more, as required, to grow these splendid flowers. Nothing can be prettier. Messrs. Giles and Halliday, and Mrs. Thomas staged some good cactus dahlias, while the roses were also good. Those exhibited by Mr. Arthur Scarfe, in his artistic fashion, won the first prize easily. The twelve he staged were Golden Gate, Reine Victoria, Marechal Neil, La France, Reine Marie Henriette, Niphetos, Ethel Brownlow, Laurette, The Bride, Mamen Cochet, Marquise Litta, and Kaiserin Augusta Victoria.

The exhibits of Delphiniums, few though they were, called for much praise, but the staging detracted from their beauty. They did not look any the better for flopping about in every direction, as though they were suffering a recovery from a previous night's storm. The Gladioli were good, but might have been better, and the Carnations attracted a great deal of attention from specialists

That South Australia has a flower loving population is amply testified by the number of Flower Shows that are annually held in the suburban and country towns. Space will not permit of mentioning them in anything like detail, but we have received reports from two of the long distance northern towns of Laura and Jamestown. Laura is the town near to the Wirrabara forest reserve, and the foresters engaged there keep up a keen interest in flowers. So much so that the Autumn Queen has representatives at the Adelaide Show. Mr. Melville, the President of the Society, had the pleasure of beating all growers outside the city for the best twelve blooms. The show at Laura had some excellent blooms staged, particularly those of Armetta Henley by Mr. Curtis, Florence Molyneux, Marshia Jones and Ma Perfection by Mr. Melville, and Louis Boehmer by Mr. Blesing. A feature of the Show was the Competition in floral designs. These were tastefully put up in the form of a gate, a ladder, a cradle, a coronation crown, and a wedding cake. Miss E. L. Blesing's gate carried off first honors. Misses A. and F Bowker gained the popular vote for their table decoration.

Another report comes from the Jamestown Show. This town is famous for its tree plantations, of which it has reason to be proud, as may be understood when it is mentioned that its main street is three chains wide, carrying three roads and two plantations down the centre. The Bundaleer forest reserve is in this district and helps to beautify the surroundings. But the townsfolk are fond of flowers. They hold two shows in the year, and many minor gatherings of a more or less decorative character. This year, the Chrysanthemum show was regarded as the best ever held, but a number of other exhibits of varying character helped to make the hall attractive. We have pleasure in presenting a picture of prize blooms shown by Mrs Schubert, who has gained quite an enviable notoriety in growing the Japanese national flower. These blooms were grown out in the open garden without any protection from the weather, and it will be seen that they compare favourably with those in the champion exhibit at the Adelaide Show. The white bloom on the left hand side is a Lady Tennyson, and the white one above it is Agnes Flight. Immediately on the right of this is Good Gracious and the vari-colored Jumbo. The white bloom on the right is a hairy Ostrich Plume, while in the centre is a Buff Globe standing on a white collar. The weather stain on this bloom was probably the cause of its having to stand down in favour of Mr. Haskard's champion flower. Hiding behind this bloom is one of the anemone variety, Rider-Haggard, and the others too numerous to name are all good blooms. In conversation with Mrs. Schubert, the lady said that she had some 200 varieties under cultivation planted in ordinary ground. This is trenched alongside the rows with manure, mulched with anything that will cover the ground, to keep in the moisture. Care is exercised not to overwater them, which is worse than not enough, and liquid manure is applied once a week. They were cut back to 4 inches in October, and then only the leader allowed to grow and flower.

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CRESTED BIRD'S NEST FERN.

The only plant known of this remarkable Fern was introduced to Kew from Queensland two years ago, and as it bore ripe spores a sowing was at once made, from which a large batch of plants were raised. These have grown into nice plants, and a large proportion, probably 50 per cent., have developed the character peculiar to the parent, namely, fronds which, instead of being strap-shaped and simple, are branched or lobed so much as in some cases to be distinctly bi-pinnatifid. The type, Asplenium Nidus, is now one of the most popular of Ferns for use in room decoration, thousands of it being disposed of annually by some of the principal London market growers. It is therefore probable that the new variety may also find favor as a commercial plant. Botanically it is interesting, because of its being a wild sport which has reproduced its peculiar characters from spores.

June is the Month to Plant Roses.

NOTES ON NEW ROSES.

"Bessie Brown."

Ben Cant, a clear crimson H.P., will be welcomed as an exhibition flower, whilst the non-exhibitor will not regret investing in a plant of Lady Roberts. This new colored H.T. will, without doubt, take a front rank place.

A large, full, well-formed H.T. is England's glory, which is of a clear flesh color. Its delightful scent, vigorous growth, and patriotic name should make it as popular here as American Beauty is in the States.

Duchess of Portland has not been on trial sufficiently long to get the best results, but its pale sulphur flowers are a welcome addition to the H.T.'s.

Who has not heard of Mildred Grant? Its silvery white flowers, edged with pink, make it an object deserving of praise, although I overheard one lady critic at the Temple exclaim, "Great ugly thing! Such a poor color!" I am disposed to think that she was partially color-blind, or possibly a badly beaten exhibitor.

Lady Battersea, with its long, pointed buds, makes an excellent buttonhole; the cherry red color is very taking. Another H.T. is Mrs. B. R. Cant, deep rose, suffused with buff.

Alexandra, an orange buff Tea with apricot shadings, is a pleasing flower, whilst Gladys Harkness is a most vigorous H.T. of a deep salmon; the individual blooms are large and freely produced.

A good Rose is Lady Clanmorris, a creamy white H.T. with a centre of pale salmon. As a golden yellow Tea Lady Mary Corry will take some beating, the form being perfect.

Liberty, velvety crimson, will, as a buttonhole Rose, rival any. It bears wires with impunity, and the color and substance are very lasting.

For strength of stem the H.T. Tennyson, is almost unique. This season the early flowers centred badly, but this defect has disappeared with better weather. The flower is large, pale pink, and requires some disbudding.

Gruss an Teplitz has frequently been mentioned, but another reference will not make its crimson scarlet flowers fade.

Princess May, silvery pink, nearly white, promises well. It is a good grower, and free.

Lady Beauclerc is a H.T. of beautiful

form. It is very free, too. The shade would be termed a madder rose.

Mamie, formerly Mrs. Conway Jones, is a Rose for the exhibitor, the rosy carmine tint being distinct.

The American Robert Scott, although somewhat coarse, assuredly possesses merits, or it would lack the support given it over the water. As a forcer one of our big growers speaks highly of it.

Now I must dip back a few years.

Bessie Brown, Dickson's 1899 triumph, is still the H.T. of the time.

For exquisite coloring Madame Abel Chatenay is superb, despite its being in its seventh year.

Madame Cadeau Ramey is another superb French Rose, dating back to 1896.

Although 1893 and 1895 Roses respectively, Marquise Litta and Mrs. W. J. Grant can almost rank as new, and the splendid samples at the recent show at the Temple would prompt any one to grow them.

Maman Cochet deserves a place here among Teas, although 1893 saw its introduction. And to speak of Maman Cochet without noting its white companion would be criminal.

Dickson did us all a good turn when he introduced Mrs. Edward Mawley in 1899.

Clara Watson, of 1894, and Antoine Rivoire, 1895, are deserving a prominent place among H.T.'s, whilst Killarney, even if it had been a hundred years instead of four in British gardens, must be mentioned, for it was among the most beautiful of all Roses at the Temple.

Marquise de Salisbury, although in its twelfth year, is a monument among crimsons, while for buttonholes the canary yellow Madame Pernet Ducher is exquisite. Its age is eleven years.

I will conclude by saying a word for Madame Jules Grolez, a vigorous grower and of distinct color, introduced five years ago.—"The Gardener."

T. A. WESTON.

TWELVE BEST ROSES.

THE "ARGUS" SELECTION.

The number of letters received in regard to the selection of the best twelve roses were so numerous that it was quite impossible to find space for them. The total was 1,444, bringing the total number of selections received up to 381. The final count places La France at the head of the list with the splendid vote of 338, Maman Cochet holding second position with 324 votes. Kaiserin Augusta Victoria has moved up and taken fourth place, while Belle Siebrecht has finally beaten Marie Van Houtte for twelfth position.

La France, with its beautiful shape, delicate pale pink colour, and fine perfume, is an old rose, having been raised by M. J. B. Guillot, Jun., in 1867. Mamam Cochet is a modern rose, raised by M. Cochet in 1893. It is of great size and substance, with fine long buds, and flesh-coloured. The Bride is a pure white sport from Catherine Mermet, often having the edges of the petals tinted with a delicate touch of rose colour. Kaiserin Augusta Victoria was raised by Lambert and Reiter in 1891. It is pure white, with creamy yellow centre, the outer petals well reflexed. Prince Camille de Rohan is a hybrid perpetual rose, crimson maroon in colour, a free bloomer, and one of the best dark roses grown. Marechal Niel, Cloth of Gold, and Madame Lambard are too well known to need description. White Maman Cochet, which first made its apperance in 1897, is simply a pure white sport of Maman Cochet. Niphetos is a pure white bloom, raised by Bougere in 1844. Mrs John Laing is another hybrid perpetual, which was raised by Bennett in 1887. It is a beautiful, soft, clear pink in colour, and of exquisite shape Belle Siebrecht is quite a modern rose. It was raised in England in 1895 by Messrs. A. Dickson and Sons, and sent out under the name of Mrs. W. J. Grant. But the rose and all the stock raised from it was sold to an American firm, who at once changed the name to Belle Siebrecht.

The fine response which has been made to the proposal to indicate by popular opinion the best 12 roses is an indication of how widespread rose cultivation is in the State. It may be said, also, that popular taste has proved in this case to be good taste. The roses which have been finally approved of are worthy of a place in any garden.

THE WINNING TWELVE.

La France	338
Maman Cochet	324
The Bride	254
Kaiserin Augusta Victoria	219
Prince Camille de Rohan ...	209
Marechal Niel	201
White Maman Cochet ...	192
Cloth of Gold	182
Madame Lambard	177
Niphetos	143
Mrs. John Laing	123
Belle Siebrecht	121

The other roses which occupy prominent positions are:—

Marie Van Houtte ...	114
Devoniensis	91
Catherine Mermet	69
Caroline Testout	58
Perle des Jardins	55
Sunset	49
Lord Tarquin	48
Sefrano	44
Papa Goutier	43
Madame Abel Chatenay ...	43
Souvenir de Elice Vardin	43
Climbing Niphetos ...	39
Reine Marie Henriette ...	39
Madame de Wattville ...	38
Comtesse de Nadaillac ...	38
Madame Jules Grolez ...	38

HYBRID TEA ROSES.

Taking the true decorative kinds first, the following are all worthy of a place in any collection:—

Antoine Rivoire: The flowers of this are rosy flesh shaded with yellow, Camellia-like in form, and very beautiful.

Killarney: Most distinct and attractive; large, semi-double, pale pink flowers and exquisitely pointed buds, growth vigorous, quite as free as Viscountess Folkestone.

Mme. Jules Grolez: A very fine kind. Its clear silvery rose color is perfectly distinct from any other Rose. There is also a pretty yellow shading at the base of petals. The buds are long and pointed. Altogether a good garden Rose.

Aurora is very free flowering, sweetly fragrant, and vigorous in growth. If severely disbudded its flowers become very large. It was finely shown in pots at the Temple Flower Show two or three years ago.

Mme. Eugene Boullet: A very distinct variety in color. It may be described as yellow, with a salmon and carmine shading. Probably this will make a good exhibition Rose. Its growths are stiff and strong, after the Hybrid Perpetual style.

Ferdinand Batel is another with conspicuous yellow shading. Although not large enough for exhibition, the flowers are evenly arranged, and the color delightful. This yellow shading is characteristic of many of the newer Hybrid Teas. A really fine Rose is

Germaine Trochon: In growth it is very vigorous, but stiff, and its flowers are produced in fine trusses. The color is a pretty orange yellow. This variety and Gustave Regis are just the kinds to plant for bold effect. In large gardens one requires some tall beds for certain positions. If the plants are obtainable with an erect habit so much the better. Therefore, this Rose is adapted for this purpose. Two other fine garden kinds are

Clara Watson and Souvenir du President Carnot, the latter resembling a refined Souvenir de la Malmaison.

L'Innocence: It has been good under glass, but that is often very misleading as to the behaviour of a Rose outdoors. I should like to know more of this kind in the open.

HYBRID TEA ROSES FOR SHOW.

The following may be accepted as genuine additions to our show Roses. First to mention is

Mrs. W. J. Grant: One cannot speak too highly of this magnificent Rose. For beauty of petal it is unrivalled, and it is wonderfully free. I cannot say I care much for it in autumn. Its fresh colors seem to have gone.

Marquise Litta, I believe, will be extensively grown under glass for market. It is one of the best pot Roses, and we have evidence of its popularity as an exhibition flower by the large numbers shown last season.

Mme. Cadeau Ramey has also gained

notoriety, and deservedly so. Its fine globular high-centred form and rosy flesh color, with a distinct yellow base, make it a valuable addition to our show Roses.

Tennyson is a Rose that will be warmly welcomed by exhibitors, not so much, perhaps, for its form as for its splendid lasting qualities. It was finely shown at Manchester, and also at the Hybrid Conference at Chiswick. On both occasions the heat was tropical, but this seemed to have no effect upon the substantial flowers.

Papa Lambert should make a good exhibition flower, that is if the color, which is rose, proves to be clear enough. In growth it much resembles Baroness Rothschild.

Bessie Brown is a magnificent variety. It is of pointed globular form, and appears to be of vigorous growth.

A word or two as to

STOCKS

may be acceptable. I have found the Briar the most suitable; but I am aware the Polyantha stock finds much favor, especially it budded where the plants are to remain. The hedge Briar undoubtedly yields the finest exhibition flowers, but for the garden the Briar cutting or seedling Briar are by far the best stocks for Hybrid Tea and Tea-scented Roses.

If I had a shallow soil, I should have the majority of my Roses upon the briar cutting. Their roots are more spreading than the seedlings, but where a good depth of soil is available, then I would select the seedling Briar.

PHILOMEL.

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SIX GOOD TEA ROSES.

[From "The Garden.']

Certainly one of the most delightful Tea Roses of autumn is the beautiful variety George Nabonnand. It is one of those kinds of which we are now obtaining a good number. The flowers are practically semi-double, but the buds and half-expanded blossoms in the cooler days of late summer and autumn equal, if they do not surpass, the stately exhibition flower. But there is another very important point in their favor, and that is they will grow well. In the Rose gardens of the future the poor growers will be banished, and we shall see fine bushes of kinds like G. Nabonnand, from which one can cull handful of long-stemmed blossoms and scarcely miss them. To make a selection of half-a-dozen good Teas for the garden out of the vast collection at our disposal is no easy task, but, bearing in mind the all-important matter of vigorous growth, I can with confidence recommend the kinds enumerated below. I do not know of any Tea Rose likely to give more satisfaction than

Marie Van Houtte. The splendid growths which break out near the base of the bushes are crowned with glorious trusses of cream and rosy pink flowers. The fine trusses the growths will carry are examples of what a truss of blossom should be.

Mme. Hoste is another beautiful kind, so free in every respect. One is always sure of being able to cut a good bouquet of this Rose, and, being almost a pure self color of pale lemon-yellow, it has its admirers on that account. Then there is

Anna Ollivier, from which the last-named was surely either raised or is a sport. How variable in color this Rose is. Usually the blossoms are pale buff, with a deep fawn shading about half the depth of the very long buds, but at times, especially under glass, this fawn tint becomes so intense that one scarcely recognises the Rose.

Mme. Lambard is as much a favorite now as when first seen some twenty-three years ago. Here again we have the remarkable capricious characteristic of the Tea Rose, for one can cut off the same plant almost crimson buds and salmon and bronze open flowers.

Enchantress is deservedly entitled to a foremost position among the best Tea Roses for the garden. If ever the term "Monthly Rose" was entitled to be given to any kind it would be to this beautiful variety, for it will bloom as freely during the darkest months of the year as in the summer and autumn. Enchantress always reminds me of that grand old Rose, Mrs. Bosanquet, only that it has creamy white flowers and all the refinement of a pure Tea in its splendid shell-like petals. How strange that some of our best garden Tea Roses rarely put in an appearance at the Rose shows, which is a proof to me that if planters wish to know what is best to plant in the garden they should make a point of seeing for themselves a good up-to-date collection.

Marie d'Orleans is one of those lovely Riviera Roses to which the above remarks would apply. In the autumn its rich rose flowers so fantastically pointed are very conspicuous even among a large collection. There is yet another that has even not yet obtained an entrance into many Rose catalogues, but which must be sooner or later in every garden. I allude to

Comtesse Festetics Hamilton.—One has heard much of General Schablikine, but they need not trouble about this if the first-named is secured. The coppery shading on the carmine ground is a delightful mixture of coloring.

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CLIMBING ROSES IN BUSH FORM.

Because some Roses are extra vigorous in growth they are catalogued under the heading of climbers, and the unitiated naturally suppose that a wall or fence is essential for them. But let any one try them as bushes, and he will be pleased with the result. I do not say they should be mingled with the true dwarf-growing Roses, for nothing appears so incongruous as a rampant Rose on the outside bed or border and a weak, puny grower in the centre. What I do advise is that these climbers and semi-climbers be grouped together in good bold beds, keeping the extra vigorous kinds in the background. Of course, such plants require plenty of space. I do not consider 4 ft. apart each way any too much for their proper development. The first season the plants will look somewhat strange, for they are generally supplied from the nursery with shoots ranging from 3 to 5 ft. in length, and these are in most cases of a very rigid nature. However, the second season all formality disappears as the grand shoots break up from the base of the plants. At pruning time these climbers should be cut down to about 18 in. to 24 in. from the ground, and it will be found that a great number of the new growths will bear flowers at their points. In my opinion these climbers form ideal bushes with their long wavy branches swaying about with their crown of blossom, and in course of time many of the older growths will be induced to produce blossom almost the entire length of the shoot. An important fact to remember is that we have some of the best yellow Roses among these climbers. Of course, if one could obtain a Mme. Hoste with the color of Marechal Neil, a superb acquisition would be gained. But until we obtain such an one, we must perforce go to the climbers and semi-climbers for this very valuable color. All stiffness should be banished from the Rose garden, and this may be best accomplished by employing the less rigid growing kinds. As standards these climbers make excellent heads, strong, bushy, and spreading. It is surely far better to see a well-developed head of a standard Gloire de Dijon, Mme. Berard, or Reine Marie Henriette than a puny, stumpy one of a Baroness Rothschild or an Etienne Levet. In mentioning a few of the extra vigorous kinds that give good results if treated as described, one must place first the ever-popular Gloire de Dijon. Other excellent kinds of the same race are Mme. Berard, Belle Lyonnaise, Bouquet d'Or, Kaiserin Friedrich, together with Duchesse d'Auerstadt, Mme. Moreau, Germaine de Mareste, Henriette de Beauveau, Mme. B. Levet, La Soliel, Joseph Bernacchi, William Allen Richardson, Celine Forestier, Pink Rover, Souv. de Mme. Joseph Metral, Waltham Climber No. 1, and Marie Robert. The semi-climbing kinds are best represented by Gustave Regis, Mme Pierre Cochet, l'Ideal, Mme. Eugene Verdier, Mme. Chauvry, Mme. Jules Siegfried, Dr. Rouges, Germaine Trochon, Mme. Marie Lavallee, M. Desir, Rosette de la Legion d'Honneur, Alister Stella Gray, and Mme. Wagram. Other Roses of other classes suitable for the same mode of culture are Robusta, Climbing Capt. Christy, Gloire de Margottin, Bardou Job, Gloire des Rosmanes, Mrs. Paul, and Climbing Souv. de la Malmaison.—P. in "The Garden."

HARDY AND TENDER ROSES.

It will, I think, be generally conceded that our modern Roses are, as a rule, far more beautiful and far more free-flowering than most of the old-fashioned varieties still in cultivation. Indeed, the advance made during the last thirty or forty years towards perfection of form, in variety and charm of color, and in floriferousness is little short of marvellous. There are, however, two important qualities, in which it must be confessed many of the old-fashioned Roses, when compared with those of the present day, are superior. They are, generally speaking, more sweet-scented, and are, moreover, of a hardier constitution.

As regards the latter quality, with which we are for the moment more particularly concerned, there are but few of our up-to-date Roses which do not suffer to a greater or less extent whenever the winter happens to be in any way exceptionally severe. Take, for instance, the last cold winter. The only Roses in my collection, with two exceptions, which passed through it altogether uninjured to the tips of their shoots, and which can, therefore, be regarded as perfectly hardy, were such very old favorites as the common Provence, or old Cabbage, as it is disrespectfully called; its equally fragrant sister, the common Moss; that ever-blooming Scotch Rose which is much less frequently grown that it should be, Stanwell Perpetual; all the Austrian Briars; and that rampant and hardy Ayrshire Rose, Bennett's Seedling or Thoresbyana. Two of the pioneers of the Hybrid Perpetual race—Jules Margottin and Duchess of Sutherland—were but slightly injured. Now, the only modern Roses in my garden which could compare with the foregoing in hardiness—if we adopt the same severe test, and except such single-flowered varieties as some of the Rugosas and Hybrid Sweet Briars—were that charming Hybrid Tea, Gustav Regis and Crimson Rambler.

Among the Roses most largely grown in the present day, the Hybrid Perpetuals are undoubtedly the least tender. In this class the varieties which are more or less thorny stand, I find, hard winters the best, especially A. K. Williams, Mme. Gabriel Luizet, and Marie Baumann. On the other hand, such smooth-wooded kinds as Comtesse d'Oxford, Pride of Waltham, Reynolds-Hole, and the like are remarkably susceptible to frost. Next in their ability to withstand keen winters come the Hybrid Teas, some few of which—for instance, La France and Gustave Regis—are quite as hardy as the hardiest of the H.P.'s. At the bottom of this scale of hardiness we must unfortunately place that lovely section, the Teas and Noisettes.

These tender, or at best only half hardy Teas and Noisettes, are, as is well-known, among the choicest and most delicately tinted of all Roses, and are, therefore, well worthy of any extra care and attention they may require in order to preserve them from severe injuries during the winter months. All varieties are by no means equally tender. Of those least susceptible to cold may be mentioned Francisca Kruger, Mme. Lambard, Anna Ilivier, Caroline Kuster (Noisette), Souvenir d'un Ami, and Souvenir de S. A. Prince. Whereas such kinds as Sunset, Perle des Jardins, Mme. de Watteville, and Niphetos suffer most keenly during periods of severe or prolonged frost. In all

Bleak and Exposed Situations,

and particularly where the soil is cold and retentive, Tea Roses should be grown—as recommended many years ago by Mr. George Paul—in beds raised a few inches above the general level of the ground. This plan will tend to keep the beds warmer and drier than they otherwise would be. In cold districts it will also be well to thin out all the sappy shoots, in order to arrest any further growth of the plants, and at the same time by admitting additional light and air to enable those that remain to become better ripened before the winter sets in.

I have tried many methods of protecting both dwarf and standard Teas, and have come to the conclusion that, after all, the simplest and the most easily applied prove in the end the best. For instance, dwarf plants need only have the surrounding soil drawn over their crowns to the height of 4 in. or 5 in. in order to preserve them from serious injury. In severe winter the shoots rising above the covering of soil may be, and no doubt will be, greatly damaged; but when these shoots are cut away at pruning time the plants will in most cases start again into growth as vigorously as usual. Further protection, if desired, may be afforded by twisting in lightly pieces of bracken among these shoots. I have, however, invariably found that such additional protection, although doubtless of some service in moderate winters, was rather harmful than otherwise during a very mild one, and not sufficient to do any real good in any winter of exceptional severity. Many apply a mulching of manure to the beds in the autumn, but the earthing-up method is preferable, as it affords the plants more efficient protection without keeping the soil in a cold and sodden state should the winter prove wet.

Standard Teas

are the most difficult to protect. Of all the plans I have tried, the following I have found the most effectual. In the first instance, to shield the most vulnerable part of the plants from injury a hay band should be wound round the junction of the Rose with the stock. Then, in order to prevent rain finding its way into the centre of the head, the best shoots should be gathered together and fastened as far as practicable in a conical form to the top of a stake firmly driven into the ground and passing through the head of the plant and above it. Some straw should then be combed out and the head lightly thatched with it, and the upper ends secured to the stake, adding one or two horizontal ties lower down to keep the straw in its place during high winds. It will be found helpful in carrying out this method of protection to cut out in the first instance all the soft and sappy shoots.

For climbing Roses on walls I find that fine cotton matting or, failing this, a double thickness or ordinary fish-netting, arranged loosely, but firmly secured over them, will be found in all but very exceptional cases sufficiently effectual. This plan has the further advantage of not excluding light and air from the shoots, so that they do not become as tender as when a mat or other close material is used in a similar way. Another plan would be to place pieces of fir or bracken among the branches. While on the question of bracken I may say that this fern to be of any real service should be cut early in the season, for if cut when it has turned quite brown it becomes brittle and of comparatively little value.

When several mild winters occur in succession the tendency is to undervalue protection of any kind, or, at all events, to defer affording any shelter to Tea Roses until reminded of its necessity by the sudden advent of an unusually severe frost, when no earthing-up of the dwarf plants is possible and the thatching of the heads of the standards is equally impracticable. Under such circumstances the only thing to be done is to place some bracken or dry leaves round the dwarfs and work in some bracken or light evergreens into the heads of the standards.

But the wise rosarian will not allow himself to be caught napping in this way, but will arrange some fixed date in the early winter, and, having a supply of bracken and straw ready, will at once proceed to carry out the foregoing or similar directions for the safety of his Teas. I mention a supply of bracken because, should the sod in the beds be saturated, some of this can be tucked round the lower part of the dwarf plants in order to keep the wet soil coming into direct contact with the shoots. None but the enthusiastic Rose grower can appreciate the feeling of comfort and relief which comes over him whenever a sharp frost sets in unexpectedly, when he knows that all his delicate Roses have long since been securely protected, and that no cold wind or keen frost that may follow can seriously injure them. —Edwd. Mawley in "The Garden."

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"Sticks."—Various methods are in vogue for supporting Carnations. A favoured idea in England is the use of wire netting doubled like a V upside down between the rows. Another is the overhead method, with strings drawn across beds from supports. The most effective, however, appears to be the use of a wire netting about eighteen inches high placed around the plant.

CARNATIONS.

THE S.A CARNATION AND PICOTEE SOCIETY.

On Tuesday evening, Mry 7th, a well attended meeting of Carnation growers, convened by Mr. H. Ising, was held at the Exchange Hotel, Adelaide.

Dr. Harrold was voted to the chair.

The chairman called upon the convener, Mr. Ising, to state the objects of the meeting, which he did. The chairman and several gentlemen joined in the discussion which ensued. The meeting was enthusiastic, and of one mind apparently, and from the tone of speakers' remarks generally, the society should be strong numerically and in all respects.

Objects.—The following clauses were submitted to the meeting and passed:—

1. To encourage the growing of Carnations and Picotees.
2. To encourage the exhibiting of Carnations and Picotees at all horticultural shows in a manner to be dealt with by the committee of the society.
3. To hold Carnation and Picotee exhibitions.
4. To adopt standards whereby Carnations and Picotees shall be judged according to their respective classes.
5. To grant awards of merit and first-class certificates for colonially-raised Carnations and Picotees complying with rules laid down by this society.

Exhibitions.—An exhibition shall be held between the 20th of October and 21st November each year, date and place to be fixed by the committee, after finding the average day of full bloom of the largest number of cultivators, who shall be members of the society.

The election of officers and committee resulted as follows:—President, Dr. Harrold; Vice-President, Mr. H. Ising; Hon. Secretary, Mr. D. T. Laurie; Hon. Treasurer, Mr. T. Fairey; Hon. Auditors, Messrs. H. Blinman and R. H. Hein; Committee, Messrs. Blinman, J. Beggs, Hein, Weidenhofer, Pretty, Sewell, J. A. Potter, F. Smith.

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AN HOUR WITH A CARNATION SECRETARY.

MR. HENWOOD, OF THE NATIONAL CARNATION SOCIETY, LONDON, IS AT HOME.

[" The Gardener."]

"I have only a backyard!" remarked Mr. Henwood as a preliminary, "but I manage to do a little in it, as you see. All my Carnations are grown in pots."

"What is your secret of success, Mr. Henwood?"

"My secret? I have none. Yet, stay: I have a very deep-rooted opinion that the use and abuse of the water pot have much to answer for. If you like to call it a 'secret,' this fact which everybody ought to know, it is that florist's flowers generally, and Carnations in particular, have a strong dislike to over-watering, which means sour soil, no roots, little 'grass,' poor plants, and ultimately dead ones. I am quite sure that any little success I may have had with both Carnations and Auriculas has only been gained by paying strict attention to the golden rule of never watering a plant until it is dry, and then giving enough to soak the ball thoroughly."

"You don't call the Carnation a 'miffy' plant, then?"

" 'Miffy'? Not at all. Do those plants look 'miffy'?" And he pointed with pardonable pride to a fine batch in 10-in. pots. "You woudn't think they were layers last year, eh? But they were."

"Then how do you think the Rose and the Carnation stand with regard to each other as the popular flower?"

The question went home, and the enthusiast stood revealed if never before.

"Why, man, everybody would surely admit that the Carnation is equally as well up as the Rose. My own opinion is that it is higher. Look you: we can get Carnations, and good ones, all the year round. Then look at the Malmaison, what a glorious flower it is since Mr. Martin Smith took it in hand.

"The best Malmaison? Ah!" And there was a wealth of meaning in the monosyllable. "Why don't you ask for the best six or eight? But let me see, I think that I should vote for Mrs. Martin Smith as the best of any variety in general cultivation. You see, there are others coming," and he shook his head mysteriously.

"Would you care to give me the names of twelve varieties suitable for an amateur who wants to try his hand at Carnations?" was my next question.

A little reflection, and the names came, tripping off the tongue lovingly, as if they recalled fond memories: "Henry Falkland, Lady Bristol, Childe Harold, and Daniel Defoe, all yellow-ground Picotees, and good ones, too; no 'miffy' ones." That word seemed to have stuck.

"Then Muleteer, Oakley, Duke of Albany, and Charles Martel make a fine quartette of Fancies; while for Selfs I should vote for Wild Swan, white; Gil Polo, crimson; Bomba, rose; and Regina, yellow. All these are easy to grow, not high in price, and the flowers are of first-rate quality.

"Flakes, Bizarres, and White-ground Picotees? No! not just yet. Mr. Martin Smith is taking them in hand, and from what I know of his thoroughness there will be some good new varieties before long."

"Now, Mr. Henwood, I should like to hear something about your connection with the 'National' society."

"Well, we are progressing, and I think the society has by no means yet reached the limit of its usefulness. But the work! Ah, that is enormous. Here, you see, are some of the society's annual reports, sent out in 1884—a modest four pages!! Contrast them with the report for 1900—sixty pages. That gives you an idea how the work grows."

"You are asked many questions, I suppose, from Carnation lovers in various parts of the country?"

"Questions, my dear sir, don't mention them: they come in by the score, and it would take me half of every day in the year to answer them all properly."

It may as well be mentioned here that Mr. Henwood has been connected with the "National" for upwards of twenty years, has been its honorary treasurer for twelve years, and its honorary secretary since 1897. When he first took charge of the finances there was a deficit of nearly £3, which, in the year following, was turned into a balance on the right side of £12, and as the years went this balance grew, until it reached its highest point in 1899, when £229/11/10 represented the surplus. The members' list also shows a healthy growth, and, although the South African war thinned the ranks of Carnation lovers to a remarkable extent—most of us regard the Carnationist as a peace lover—the current season is bringing in many a recruit."

With this all in my mind I ventured to say: "Your connection with the 'National' has been a wonderfully happy one, Mr. Henwood."

"It is Mr. Martin Smith," was the quick retort. "No floral society that I know of has a president who is so closely identified with the work of the society over whose executive he presides. I don't know what we should do without him."

From the raiser of new varieties to the novelties themselves is not a far cry, and here two sturdy plants were pointed out to me.

"See those?" I replied that I did. "Well, they're going to be 'eye-openers' presently."

"Blue Carnation, eh?"

"No, no" (this rather sadly), "I am afraid that that is impossible. What do you think of my Ferns?"

It does not do to trench too closely upon the surprises of the florist. He loves to astonish. Meanwhile the camera-wielder of "The Gardener" will do well to watch what comes from Reading.

But to the Ferns, which I had been invited to view. "I love a collection of anything, you know," was his introduction; and I make bold to say that Mr. Henwood's eye is as good for the crested and tasselled beauties of hardy Ferns as for his beloved Auriculas and "Gilly-flowers."

Like everything else they are well grown, too.

We have all heard of the man with a hobby, but the genial secretary of the "National" is a man with several hobbies. Once upon a time, as the fairy tales say, he was a staunch Columbarian; never a keener pigeon fancier than he, few more successful. Then came Auriculas and Carnations. Now he has Roses and Daffodils, and hardy Ferns.

But even all these do not exhaust the capabilities of that "backyard." A door opened, and I found that the pigeon house that was, and the potting shed that is, is also adorned by a business-like ping-pong table.

Pigeon house! Potting shed! Ping-pong! That backyard is unique. So, too, is a pretty screw shot which Mr. Henwood has slyly dubbed his "blue Carnation." The reason I will leave my readers to discover.

Cnicus.

THE WINTER-FLOWERING CARNATIONS.

Since the introduction of the Margaret Carnations, as they are termed, quite a new and beautiful addition has been made to our winter-flowering kinds, and they are so easily grown that any one, even with but little knowledge of gardening, can grow and flower them. I have grown about 200 plants in 6-in. pots this year, and as these were produced from an eighteenpenny packet of seed the cost is also inconsiderable. The seed ought not to be sown too early. The plants when well attended begin to flower in four or five months from the time of sowing the seed. I sowed the packet of seed alluded to, and placed the small seed-pan on an ordinary hot-bed, and the plants were up and the seed-leaves developed in a week or so. The point, I think, of most importance is to get them pricked off into boxes, placing them in the same temperature until they are established, when they are gradually inured to the open air. If the plants are pricked out about 3 in. asunder they may remain in the boxes until they are large enough to pot off into 3-in. pots; when well established in these pot them into 6-in. pots. They grow faster than Tree Carnations, or even the border varieties, with similar treatment, and arrive more rapidly at the flowering stage. The potting soil should be rich, good loam, to which have been added a fourth part of leaf-mould and as much decayed manure, and in potting, pound the soil well in round the sides of the ball of roots. Firm potting is a desideratum in growing Carnations. Another way of treating these Carnations, and by which good results are obtained, is to plant out the young plants in the open garden instead of putting them up into 3-in. flowerpots. Plant them firmly about a foot asunder in ordinary garden soil, but if time can be spared a little good potting soil should be put around the roots of each plant at the time of planting; the roots work into this good soil and the plants can be lifted with a greater mass of roots when they are potted into the 6-in. flower-pots. It is a good plan to place the plants in a cold frame, the lights of which should be kept rather close for a week or so until they are fairly well established. I believe the best results are obtained with plants that have not been planted out, as the slight check they receive in lifting them is certainly injurious.

When I sowed the seed of the Marguerite Carnations I also sowed seed of the tree or perpetual-flowering varieties, and saved about 600 plants of these. They also grew with considerable vigor, and I was interested not only in growing some 300 or 400 plants in pots, but the remainder were planted in the open border to take their chance with the ordinary seedlings raised from the border and show Carnations. The seedlings from the Tree or perpetual-flowering varieties certainly grew with greater vigor in the borders, and the two sets of seedlings could readily be distinguished at a distance by the more branching habit of growth, and many of them ran up to flower, which the others did not. If these had been lifted and potted doubtless they would have flowered in the Carnation house now, but I had so many in pots that space was not available for them. On comparing the seedlings from the Tree Carnations with the Marguerite section, the latter had the advantage in the percentage of plants that flowered, but the former were considerably in advance in the richness of the display they made and in the superior quality of the flowers and their longer lasting qualities either on the plants or cut. The Tree Carnations produced large, very double flowers, which had but little pollen and did not become self-fertilised; whereas the semi-double Marguerites are self-fertilised, and the flowers quickly fade on the plants and do not last long when cut and taken into the house. There are not so many single-flowered varieties amongst the Tree Carnations as amongst the border sorts. I find about ten or twelve per cent. of single varieties amongst the latter, but five per cent. only amongst the tree varieties.

It is also exceedingly interesting to watch the flowering of seedlings when it is known the seed has been saved from good parents; moreover, it is much easier to raise seedlings than it is to strike cuttings of Carnations and grow them up to flowering plants. Named varieties, of course, will be grown in all the best collections, and certain choice sorts can be propagated much more readily than the border varieties, which are increased by layering. The Tree Carnation, as its name implies, throws out side growths freely from the main stem. Cuttings can be taken from these side shoots, and propagation may go on for a long period. Later propagated plants succeed them, and continue the display of bloom until the summer-flowering Carnations come in. In fact, so persistent in flowering are Tree Carnations, that I undertook to have flowers all the year round from two dozen plants. I could not cut blooms every day, or even every week, all the year, but an immense number were cut, and before the last bloom had faded another had taken its place. After a time the plants produce woody stems, which increase in substance, and two-year-old specimens will produce many fine blooms at a time. Of course, the cuttings must be struck in a little bottom heat, and top heat as well, but when roots are formed the young plants should be potted off singly, and gradually inured to the open air as soon as the weather is favorable. Greenfly is almost sure to attack them, and very often red spider will do so. Keep the plants clean by fumigating with tobacco. When the plants are under glass place them as near the roof as possible, and do not fail to admit air daily. The plants do best in cold frames, from which the lights can be removed altogether in fine weather. The plants ought to be repotted as they require it, potting firmly and treating them much the same as the seedlings. The flowers develop best in the winter season in a light, airy house, with a minimum temperature of from 50 to 55 deg.—J. Douglas in "The Garden."

CAMPANULAS FOR DRY BEDS AND BORDERS.

A few years ago a solitary seedling Campanula plant grew near to an archway on a gravel path. The plant eventually attained to a height of about 4 ft. and bloomed profusely. Since then more seedlings have appeared every year, and all have grown luxuriantly and flowered freely, even when some weeds near to them have shrivelled up in the hot weather. One learns a valuable lesson from the fact that these lovely plants will thrive so well in dry places.

There are plenty of gardens in which there may be found very dry borders where flowering plants are, as a rule, a failure. Campanulas may be planted in large numbers in dry beds, and they will do well. Plants raised from seeds sown in the previous spring may be transplanted to these beds, where they will quickly get established and grow rapidly after the dry weather in summer arrives.

I wonder why it is that the tall-growing Campanulas are not more generally planted in rockeries and rooteries? Their appearance, growing in such positions, is most striking, especially when grouped amongst Ferns. Many fine specimens are lost through neglect in staking. — "The Gardener." G. G.

The ✳ Orchard.

OPERATIONS FOR JUNE.

All planting should be completed as soon as possible. Pruning is the next important matter calling for attention, and should be commenced forthwith. This operation cannot be performed haphazard, requiring, as it does, both theoretical and practical knowledge. Many instructive works on pruning are obtainable, those by local authorities being the most reliable for this country. With this information and a careful study and observation of the trees from day to day, from season to season, and from year to year, the grower should in time become skilful in this particular branch. The subject is so comprehensive, embracing all the intricate principles of plant physiology and plant growth, that it lies quite beyond the scope of a short article, and we can only confine ourselves to a few general remarks.

Let it be well understood that we prune to regulate the growth, to ensure the regular production of fruit, to keep up the vigor and vitality of the tree necessary to bring the fruit to perfection and to concentrate and direct the sap into a few important channels.

Deciduous trees, that have been well trained from their infancy, and have been systematically summer-pruned, call for comparatively little winter pruning. Speaking generally, it is reduced to the regulating of spur growth, shortening or spurring shoots, removing any superfluous branches, and all dead wood. A well trained tree should be supplied with a sufficiency of closely set natural spurs borne on its lower portions.

In the case of neglected trees the work is very much heavier. They usually carry far too much wood. The centre of a tree must always be kept open to allow the light and air free play throughout its entire space. The branches should not stand closer than 1 ft. of each other at the very least; a distance of 2 ft. would be distinctly better. On such trees the fruit is only borne towards the extremities, or, in other words, only on those portions where the light has had power to penetrate and to quicken the buds. The dense growth choking the centre has caused all else to become barren. The most important thing then is to reduce the number of branches very considerably, and to encourage shoots and spurs to form nearer the base. To do this we must endeavor to arrest the sap in its ascent by checking the head growth and keeping the leading shoots light, and cause it to rest about and flush the lower limbs. Horizontal and dependent growth is to be preferred and encouraged in a strong tree for the same reason, that the sap moving through them more slowly causes them to become fruitful. Wherever sap rests growth develops.

Every species of fruit tree, not to say every variety, calls for a different method of pruning, though the general principles are the same. The pear, apple, apricot, cherry, and plum have points in common, but the peach stands out distinct, in that it is not spur-pruned. It bears its fruit on the wood of the previous year; that is, last season's shoots and natural spurs. Its shoots, therefore, are not shortened beyond a little tipping, when the variety is known not to bear its fruit near the points. Our object in pruning the peach is to promote and provide for a succession of fruiting shoots, removing altogether those which have already functioned that others may spring in their place. These shoots are readily produced with proper management. The other classes named above are spur-pruned; that is to say, suitable shoots are retained, and are converted into spurs by being shortened. It is never advisable to leave a long artificial spur, though greater length can be left at the base of the tree than towards the top, where it would tend to a woody growth.

A short, compact, natural spur springing from a strong source is always the pruner's desideratum, and their promotion, formation, and management is his chief concern in a well-ordered, shapely tree. Subjects like some varieties of the plum, that have a tendency to form a superfluous number of upright branches with the inevitable result, a thicket of growth at the top, require a good deal of spacing and regulating of the shoots and branches. This, by-the-way, is summer work in the first instance, when we can remove with the finger and thumb what must be sawn and cut away with far more labor in subsequent winters. According to the strength or weakness of a tree must horizontal or perpendicular growth be encouraged. Only in the case of weakly trees, and where a certain design requires it, is the latter desirable. Cherry trees need little hard pruning, and they form of their own accord a sufficiency of fruit spurs. These spurs last for years, and go on extending and ramifying, so they must be pruned when they become too complicated, always taking care only to remove the exhausted growth, and to leave the fresh young growth that is to bear the fruit, preferably that situated nearest the source of the spur. This free development of spur and shoot in the cherry necessitates a certain amount of judicious thinning and regulating, and it is of the utmost importance with this class as with other fruit trees that all dead and useless matter be removed. Apricot trees require a spacing of their branches and leading shoots. They bear their fruit on natural and artificial spurs and occasional shoots on last year's wood. The spurs must be regulated, and a sufficiency of well-placed shoots converted into spurs.

Pears and apples are spur-pruned only, though their individual treatment necessarily differs slightly. This spur growth must also be regulated as it becomes exaggerated. Spacing the branches if crowded and thinning the shoots almost goes without saying. Some varieties of the plum having weaker wood than other trees, have to be favored with a more perpendicular growth to render it profitable. It has natural and artificial spurs only.

In all trees symmetry is an important point, both for appearance and economy's sake. A well-proportioned tree, in which all the growth is evenly disposed, alone will give the best results.

Vegetable Garden.

Digging, trenching, and enriching plots for vegetables must be proceeded with whenever the weather renders it practicable. Rhubarb and asparagus beds, among others, should be in active preparation, that they may be in a warm and mellow condition for planting. Both these vegetables require very deep rich soils. Existing beds of asparagus may have their annual top-dressing of rotted manure with a sprinkling of salt or seaweed combined.

In preparing beds for vegetables their capacity for manure must be kept in mind. Peas, beans, onions, spinach, cabbage, cauliflower, lettuce, and potatoes are benefited by heavy dressings of decomposed manure, while it would do harm to root crops. The latter then are better in a soil from which all the stimulating properties have been taken. Sowings can be made of broad beans, carrots, leeks, early peas, parsnips, cauliflower, Brussels sprouts, &c., and in a warm sunny border radishes, lettuces, and other salads. Prepared beds awaiting crops should be kept free from weeds and roughly dug. Advancing crops should be thinned and the beds hoed.

WHITE FOXGLOVES.

A border I have lately seen was made beautiful by masses of white Foxgloves, among which rose dark and light blue Delphiniums. This is one of those combinations of quite hardy plants that make lovely features so easily in a garden.

To raise Foxgloves from seed is the best plan where numbers are needed, and I sow mine in huge flower pots in a cold frame, leaving them to grow quite a good size before I plant them out where they are to grow permanently. A summer sowing results in nice plants to put out in September or October.

Foxgloves succeed either in sunshine or shade. They are pretty crowning banks, or springing out of the base of rockeries. A clump of white ones against a wall that is covered by a red Rose is a satisfying spectacle. They are charming in shrubbery borders, or as centre-pieces for lawn flower beds.—"The Gardener."

M. HAWTHORNE.

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The Flower Garden.

OPERATIONS FOR JULY.

July is the month during which flower gardens carry a forlorn aspect. The last rays of cheerfulness in the autumn blooms and tintings have departed, and only a few flowers out of thousands of varieties adorn the surroundings of homes. Those that remain to carry on through the winter dulness are cherished with perhaps much greater affection than is bestowed upon those that come with the spring. It is a pity that the cottage gardener does not work with more foresight to avoid this scarcity of bloom during July. It might easily be done. The mention of Phloxes, for instance, is sufficient to indicate that many a dull-looking garden plot might be enlivened and even made cheerful. It is argued over and over again, and by many gardeners of experience, that Phloxes give no satisfaction away from the higher elevations. But this is a mistaken notion. True it is that these gay little flowers are badly beaten by wind and rain in exposed positions, but given a fair amount of protection they will come up smiling with their winning tints and bright eyes. They can be kept blooming through the worst part of winter; in fact, the perennials seem to have little, if any, resting period. For appearance they cannot well be put out of place in a garden. Anywhere, of course, where they can be seen a little bed of them in a lawn, or grouped on a border, is a very pretty effect during this month, while the bolder and gayer bloomers are not there.

Then there is the Alyssum, that known as Sweet Alyssum. A patch of pure white here and there on the lawns, or, for that matter, in the meanest-looking garden that ever graced, or disgraced, a cottage, will relieve the sense of poverty in the lack of other blooms. We know of no flower that blooms more profusely from January to December. It need never be without them. The least resourceful amateur that ever was can have flowers of Alyssum in his garden during July. While Roses are dormant they can be circled with a radiance of white, while the bare brown earth has no other attractiveness than its freedom from weeds it can be sprayed with figures of white, and thus the Sweet Alyssum, so-called because in the early chronicles of superstition it was supposed to allay anger, is very dear to the winter garden.

But when we say there are no flowers in the winter month of July we fancy there appears a contemptuous smile upon the face of the devotee to the "Flower of the Gods," the Carnation. It was no less an authority than Mr. Douglas who, when writing upon winter flowering Carnations, stated that he grew as many as 200 plants in 6-in. pots from an eighteen-penny packet of seed. There are many authorities upon Carnations; in fact, the Carnation fancier is very often a gentleman who knows a great deal more than anybody else about them. We do not object to that, because, however bigoted he may appear, no doubt his heart is in his work, and every kind of information thus gained is more or less useful. Generally speaking, they love to tell all they know, and score points above everybody else. The Carnation grower is, therefore, apt to smile when he is told that there are no flowers in winter worth looking at. Amongst the multitude of authorities upon Carnations, Mr. Douglas ranks with the best, and he undertakes to have flowers from Tree varieties all the year round. So that when it is stated that July is the dullest month in the year for flowers these beauties must in no case be left out of sight. However tempting it may be to linger upon the subject of Carnations for flowers in July, we have other matters to mention for the gardener in general who does not specialise.

While flowers may be scarce it does not by any means follow that there is any lack of work. In fact, work during July is rather abundant if the gardener intends to have a show when the days begin to lengthen out and the sun makes life everywhere a little brighter. The spade, the hoe, the rake, and the pruning knife are all in vigorous demand, and either of these tools that do not show evidence of having been freely used may be taken as an indication that the garden is suffering. While operating in the garden a good deal of interest can be aroused in reforming the beds. Putting in a new path here and there, and altering the shape and size of the beds for annuals, and planting different varieties in beds. A bed that contained Pansies last season, for instance, might now be filled with Delphiniums. The change will be pleasing and gratifying, and so the alterations can be going on during this month. Where the white Stocks were alter the color to blue Lobelia or to Cornflowers, where Sweet Peas were last season climbing up a temporary affair made of a few uprights, cross pieces, and strings, shift the apparatus to another part of the garden, and put in Calliopsis; and where Antirrhiniums stood in a group, with their continuous blooming, alter the position by lifting them elsewhere, and after turning the ground well up and applying a little cow manure, plant Nemophila, the prettiest and daintiest little plants in creation. Put them into circular groups or other fashioned ideas of plots. The whole business of transforming the garden during July is the simplest matter possible if a little systematic thought is exercised in conjunction with just a little art. For a brilliant effect of rich red in a small bed or grouped on a larger bed few flowers are more attractive than the Ranunculus. A good strain of double variety never fails to catch the eye, and the bed can be kept in bloom for a long period by planting the tubers at differing depths from 3 to 6 in., so arranged in rows that the earlier and more shallow plants do not smother the younger or later growths. This idea may be new to many gardeners, and the experiment regarded as a fad. But it has been tried successfully.

The planting done now is for the beauties of spring, and while a number of gardeners are disposed to look upon the cultivation of annuals as a bother not worth the effort there is no gainsaying the fact that a garden, whether large or small, looks poor without their gaiety. The flowers are all well worth the battle against slugs and snails. One word of advice we always take pleasure in repeating is that every gardener should plant the best of everything. Good and rare plants always give the greatest satisfaction, and the cost is really only a minor consideration. And, furthermore, good things always repay a little extra care in the matter of cultivation.

The following list of annuals may be planted out this month, and seeds sown in boxes for later transplanting. By-the-way, one of the handiest possible methods of planting seeds is to make use of a corrugated iron casing. These cases can be picked up for a mere song, and will be found most serviceable when divided up with wooden partitions:—

Antirrhinum
Aquilegia
Calliopsis
Campanula
Candytuft
Centaurea
Convolvulus
Cosmea
Daisy
Delphinium
Dianthus
Eschscoltzia
Forget-me-not
Godetia
Larkspur
Linaria
Linum
Lupin
Marguerite
Nasturtium
Nemophila
Pansy
Phlox
Polyanthus
Primrose
Rhodanthe
Stocks
Sweet Pea

Lawns should be mown and top-dressed. By far the greater number of lawns are laid out in Buffalo Grass, and a very beautiful bright fresh green it provides in summer. But it does not compare with the soft, even, and pleasing effect of Couch Grass. The best, easiest, and surest method of laying a Couch Grass lawn is by obtaining sods and dividing up the roots. Any one who has Couch Grass in the garden and wishes to get rid of it will tell you that the roots can be chopped into the smallest pieces, and every eye will grow into a plant. So there should be no difficulty in getting it established. But it should never be planted in a place that may be required at any future time. Once established, it stops for ever. This does not mean that it is not possible to eradicate it, but it requires usually more persistency than the average gardener is disposed to give it.

Another planting of bulbs can be made this month. They are not specially favored by a number of gardeners, and voted a nuisance. But that is not their fault. They have a way of being in the road of the digging-fork, it is true, but a simple little stake in the ground when they have disappeared will obviate a lot of displeasure, if the gardener does not care for the extra trouble of digging them when their beauty has departed. The more satisfactory plan is to dig them up until they are wanted again, and it gives a pleasing variation to the beds to change the bloom from one color to another.

The following list of bulbs may be planted, and if necessary left in the ground for a succession of seasons without disturbance, and will be a delight from year to year:

Narcissus
Iris
Gladiolus
Amaryllids
Lilium
Tulip
Ranunculus
Anemone
Snowflake
Babiana
Ixia
Tritonia
Scilla
Agapanthus
Allium
Antholiza
Lachenallia
Morea
Ornithogalum
Oxalis
Watsonia

Some of the above-mentioned may be now considered old and out of fashion, but there are still some folks old-fashioned enough to take pleasure even in what others regard as commonplace. A question frequently asked is, "How deep should bulbs be planted?" There is no hard-and-fast rule that will apply to all bulbs, but if solid bulbs are planted from 4 to 6 in. and coated bulbs at a shallow depth under the surface the gardener will not be far wrong.

* * *

IN THE GARDEN.

(By Kent.)

Now that our flowers are past, many flower gardens have a more or less deplorable look. Decayed leaves and growths from annuals and herbaceous perennials, are saturated, often give off an offensive smell, and the whole looks dank and dreary. But this should not be the case. Remove all dead matter and lay it up to rot among weeds and a little manure. The result is a compost suited to almost every form of plant life, and especially valuable for plants in pots. If you cannot have a rubbish heap several yards away from your house, burn the refuse at once. Herbaceous phloxes, delphiniums, roses, begonias, daisies, and heaps of similar subjects will need trimming over now.

Move the surface soil between all plants, and if you can dress over with a little soot or lime so much the better. This will kill many small slugs and other pests, becoming so prevalent now that we have warm rains and genial weather. Where it is intended to divide clumps of herbaceous perennials, the work should be taken in hand at once. By dividing we get the plants nicely set, and the ground will encourage a few roots. Then we have bulbs to plant, particularly such as hyacinths, tulips, narcissus, crocuses, and snowdrops, for which there could not possibly be a better time than the present. Give them a fairly good soil, and if very stiff add some leaf-mould or sand. Bulbs do not, as a rule, need a great deal of food. They are apt to produce too much foliage when highly fed. Cultivation now will not make a flower spike, but we can assist that already stored up in the bulb.

Not a day should be lost in planting anemones. Give these an open situation, a well worked soil, not too stiff, and by no means of a wet and retentive nature. Plant the tubers four inches spart in the rows, and rows nine to twelve inches from each other. An inch and a half of soil over the tubers is ample. In all probability the warm ground will start the bulbs quickly, but one need not be alarmed to see a show of young and tender-looking growth during winter, as the anemone is quite hardy. I have found it a good plan to place the common wire peaguards over anemone beds as soon as planted. This keeps cats and birds away. Not that either of these eat or destroy the anemones, but both are a nuisance upon a dry soil worked to a good season. In very hard weather, too, one can throw a mat or other covering over the whole; for, although hardy, we get better and earlier bloom if the severe weather can be slightly broken.

In the rockery we also want a little clearing up. Here one is often tempted to do too much. For example, the dying fronds of our hardy and half-hardy ferns should not be cut off so close as is frequently the case. The fronds are nature's protection to the crown of the plant, and it is better to double them over the crown as tidily as one can than cut them away too freely. A few scillas and snowdrops dotted about in small clumps will enliven the rockery early in the season, and we have many little spots where such can be placed.

Wallflowers, pansies, violas, Silene pendula, forget-me-not, and other spring-flowering plants should be put in now; not forgetting our common primrose, certainly one of the most charming spring-blooming plants we have, and one which never fails when transplanted in the autumn.

CARNATIONS FOR SHOWS.

POINTS ABOUT EXHIBITING.

[“The Gardener.”]

Is the Carnation an exhibition flower? Judging from the immense interest taken by a certain section in the annual displays held at Crystal Palace, Birminghm, and elsewhere, one would give an affirmative reply; but when we think of the hundreds of flower shows held all over the country during the summer, and observe the scanty provision made for this charming flower, the point grows doubtful. Within limits the Carnation is popular, but we want the popularity to extend, and I know of no better means to this end than that of encouraging the members of local societies to grow Carnations by providing classes for them at the annual summer shows.

This does not mean that Carnations should be exhibited everywhere on Crystal Palace lines, nor is it necessary that everyone should be initiated into the distinctions between Flakes, Bizarres, Fancies, Picotees, and the rest of them; but we want those persons who are not experts, but who grow and love the flower for itself alone, to exhibit their favorite in a manner that is pleasing to the general observer, and does justice to the blooms

It may be said that Carnations are already exhibited at country shows. Quite so; I have seen them, and my experience prompts me to pen these lines. Let me give a few illustrations of the way in which the flowers are often displayed.

First and foremost comes the orthodox showboard. Now, I am not saying a word about the way in which blooms are staged at the Crystal Palace, because in order to observe their various points it may be necessary to exhibit them on boards with paper collars round their necks; but at country shows it is a different matter altogether. Still, the local exhibitor sticks close to his board, perhaps by right of custom, and I can imagine nothing more grotesque than the appearance of a dozen little Carnation flowers dotted about on a wooden surface, extensive enough to accommodate a similar number of large Chrysanthemums. Some exhibitors are not in possession of a proper green-faced showboard, so they make matters worse by drawing the stems of the flowers through holes bored in the bottoms of chocolate boxes and other receptacles.

Again, I have seen Carnation flowers attired in paper collars, stuck singly into the neck of glass bottles, and on one occasion I had to adjudicate on half-a-dozen blooms swimming about in a dish of water. I do not know that the exhibitors are altogether to blame for this kind of thing. Very often their resources are limited, and their experience of exhibiting is confined to their own show. The schedule simply asks for the flowers, and gives no stipulation how they shall be staged, so the exhibitors go on the same lines as they have always done.

We want to make Carnations at village shows objects of attraction and interest. How can it be done? Let the compilers of the schedule make provisions, but not in the orthodox phrase, “a dozen blooms of distinct varieties.” If the Carnation at local shows is to be a popular feature it should be exhibited in a tasteful manner, and the first step is to do away with single blooms and the showboard. It may be hard to part with the latter, but let it go for the sake of something better.

That something should take the form of simple specimen glasses, not containing a single bloom each, but three or four, lightly arranged with Carnation foliage, than which there could be no better material for associating with the flowers. Let the schedule ask for distinct varieties —three, six, or a dozen, as the case may be —as this acts as a stimulant for growers to cultivate the best, but in exhibiting them let the decorative aspect take a leading place. In support of my argument let me compare the effect of half-a-dozen slender glasses, each one containing a few flowers, lightly arranged with their own foliage, to that of six solitary blooms dotted about on the face of an ugly board.

There are other ways, too, in which the exhibiting of Carnations might be encouraged. What flower is more beautiful for a dinner table decoration? To confine a table to Carnations would give a fine opportunity for the ladies without the necessity of brain puzzling in order to decide what material shall be used. Flower baskets, epergnes, sprays, bouquets, and buttonholes are always features of interest at country shows, and help to break the monotony of the vegetable section. By making arrangements Carnations might be employed for any or all of the above, and I will undertake to say that the public would be pleased.

VERNON.

TREE CARNATIONS FOR WINTER BLOOMING.

Some authorities say that Tree Carnations are to be propagated best by cuttings. I believe in advising propagation by layering, and this method is a much easier, consequently safer, one for the inexperienced gardener to adopt. The old plants can be planted out in a pit or frame of good sandy soil, or the pots containing them can be sunk in it, all on the slant, so that the young shoots are layered without difficulty.

When layering is performed, a sprinkling should be given from the fine-rosed watering pot, and the glass of the frame should be put on. I find that to keep the layers in a closed frame for a few days, a darkened one, too, if sunshine falls on the glass, is best; then to allow some air. In a week's time the glass can be removed on quiet, cool, days, or should be supported high above the frame on tall pots, just as a shading, if the weather is hot. In this way I have successfully layered numbers of plants.

Directly the cuttings show that they are rooted by growing freely and freshly, they should be potted off, one in each 3½-in. pot. If they can be stood in a cold frame for two days, so much the better; after that I keep mine on a bed of cinder ashes, in the open, when I repot them into 6-in. pots. They go next into the cold greenhouse, where they are moderately watered during winter, have a temperature of about 60 deg., and are given liquid manure or soot water every fortnight.

When about to flower Tree Carnations should stand so that their buds are not far from the glass, and an occasional weak dose of an infusion of guano, or my favorite, sulphate of ammonia, can satisfactorily be given. Not more than three buds should be allowed to remain on a stem. Of course, they require plenty of air.

Over-watering is a frequent cause of failure, in damp, cold weather especially, as then the waterlogged soil is sure to turn sour. It is better to let the earth almost dry in the pots, then to give a thorough soaking, than to be continually moistening the surface soil.

Clever staking and tying will be needed, and an occasional light stirring of the top soil is very beneficial; after this a sprinkling of new, fresh loam will do good.

The best compost is one consisting of equal parts of sandy loam, leaf-mould, old hotbed manure, and coarse silver sand.

Those gardeners who do not yet possess a collection of Tree Carnations should purchase the best varieties only, as these are cheapest and most satisfactory in the long run.

No grower will be able to do without the lovely velvety crimson flowers of Uriah Pike, the brilliant scarlet Sir Redvers Buller, Yuletide, or Winter Cheer. Madame Therese Franco is another necessity, unless the other popular pink, Miss Joliffe, is considered sufficient; La Neige, Harrison's White, or Deutsche Brant may be chosen between for a snowy variety; salmon color can safely be represented by Pride of Folkestone, Mrs. McBurney, or Fairy.

Anna Benary is a pink, striped white; Beatrice, a white, flaked with scarlet; Juliette and Mrs. H. Cannell are deep pink; and Andalusia and Comtesse de Paris are primrose yellow.

Duke of York may be mentioned as a grand velvety crimson; Oriflamme is orange, edged with red; and Hinze's White is an excellent variety for forcing. —M. HAWTHORNE, in "The Gardener."

◆

A MAMMOTH CARNATION.

CARNATION "MISS LOUISE FABER."

Fick & Faber, of San Mateo, Cal., with whom this variety originated, claim that Miss Louise Faber is the longest-stemmed pink Carnation in existence; the stems have been known in instances to exceed 36 in. in length. The flower is a deep Bridesmaid color, and the average size is 3 in. in diameter. This seedling is now in its fourth year with the above firm, and they find it as free a bloomer as one could ask. A large bunch of this choice seedling was on exhibition at a recent meeting of the Pacific Coast Horticultural Society, and was received with marked appreciation and enthusiasm.

◆

DOUBLE ANEMONES.

HOW FIRST INTRODUCED INTO FRANCE.

A great amateur florist, by name Bachelier, obtained from the Levant the first specimens of double Anemones that were grown at Paris. But this flower would probably never have become so common in France as it is at present had it not been for a trick played by a magistrate, who had in vain requested Bachelier to give him some of the seed, offering to pay him either in money or by exchange.

The magistrate resolved upon paying a visit to M. Bachelier, and taking with him three or four friends who were in the plot. In those days magistrates wore robes so long that the train had to be held up by an attendant, and this gentleman desired his valet to let his gown fall over the flower pots placed along a certain garden-walk which he would point out to him. The party walked on, chatted, admired the flowers, discussed the best mode of rearing them, and, in short, no pains were spared to divert the attention of worthy M. Bachelier. On their arrival at that particular walk the valet, according to the instructions he had received, quietly, and as by accident, allowed the train of his master's robe to fall over the flower pots. The downy substance with which the seeds were furnished caused them to adhere to the skirt, and when the magistrate thought he had procured a sufficiently large quantity he bade adieu to his friend the florist.

Adiantum.

COLOUR IN FERNS.

I have on several occasions referred to the beautiful tints in the young fronds of some varieties, and have given lists of the best sorts. It is only under certain conditions that these bright tints are fully developed. It is essential that the plants should be fully exposed to the light, and if from the time they begin to start into new growth shading is not commenced, they will withstand a fair amount of bright sunshine. As the sun gets more powerful, some shading during the middle of the day will be necessary, but the blinds should be drawn up quite early in the afternoon; it will do no harm even if the new fronds do wither a little. It is remarkable that all of those showing the red tints seem to enjoy sunshine, while most of these of more sombre hues delight in shade, though even with shade-loving sorts it is often overdone. Even in raising spores I have found that in the pots most exposed to the light they germinate much better. I have seen pots which have been partly under a stage, where the spores have started much sooner on the side most exposed to the light, and I believe failure with seedlings often occurs through over-shading. Watering is another important matter, while in some instances I have noticed that the color has been entirely lost through allowing the plants to get too dry (this I once noticed in a batch of Doodia aspera multifida). The color will develop better if the plants are kept on the dry side at the roots, and no surface moisture should be given. Of course, this, together with being exposed to the light and sun, necessitates careful attention. I find that those which have well filled pots with roots usually produce brighter tints than newly potted plants which are growing vigorously. It is a remarkable fact that in varieties of the same species, under precisely the same conditions, some will develop the bright tints, while others retain the normal green without the slightest color, though perhaps the green may be of a lighter shade. I have noticed this particularly among the Adiantums. Often in a batch of seedlings of A. tenerum the two distinct characters may be found. Among some seedlings of A. curvatum, which is usually of a deep green shade, I have found a few plants, the young fronds of which have shown a distinct bronzy tint. I believe it is, as with flowering plants, in seedlings the individual plants will vary in depth of coloring, and if the best forms are selected when collecting spores, it may be intensified. Sufficient attention is not given to the fact that among seedling Ferns variations will be found, and that by careful selection of the best for saving spores from, there is the same opportunity of improving Ferns as other classes of plants.—"The Garden."

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The Use of Manures.

(By Mr. P. Somerville.)

Perhaps there is no other subject in which the whole human family is or ought to be more deeply interested than in the reproductiveness of the soil; yet, if we may judge from what we see and hear, very many give themselves little concern regarding it. They seem to rely on the promise—'Bread shall be given,' &c., and trouble no more about it. Of course, this is not as it ought to be, for if the soil were to leave off yielding her increase we would soon cease to exist. No doubt we get a certain amount of our living from the sea and other waters, but I am of opinion that even this source would fail. This, of course, is taking an extreme view of the case, but none the less important.

"It has been said that 'He who makes two blades of grass grow where before only one grew is a benefactor to mankind,' and this is a sentiment we all cordially endorse, provided he does not 'rob Peter to enrich Paul,' and it is evident there is a vast amount of this robbery going on. If we take, for instance, our own colony, with her vast wheat and hay fields—the produce of the former sent wherever a good market can be found, and the latter mostly consumed at home. But what is returned to the soil? Literally nothing. This is some of the robbery; see how the enrichment goes on. Look at our wealthy merchants and other moneyed men who keep several horses and perhaps a cow or two. It is surprising the amount of feed that is consumed on such places; and, of course, if there is a garden on the place it gets all the manure produced. Is there any wonder that the two blades of grass grow there, and grow luxuriantly too. We must leave the man to his own fate who, in a few years, renders good soil unable to produce anything but weeds, although I think he should be made answerable for such conduct. Perhaps it might be well for the powers that be to see that the land is fairly treated, but this is perhaps getting too near political economy, and I must not tread on such dangerous ground. However, I fearlessly assert that the land should have a fair share of the profit.

"Our subject is the preparation of manure and the best way of applying it. I have no intention of dealing with the various manures and their application to different crops; any one can acquaint himself upon this subject by consulting standard agricultural and horticultural works, but I will rather deal with one or two with which we are constantly coming in contact.

"In that excellent work, Thomson's 'Gardeners' Assistant,' the author describes manures as 'all substances which added to the soil increase its fertility. These may act either directly by supplying food to plants, or indirectly by rendering the substances already contained in the soil available for the nourishment of plants.' The gardeners' principal supply of manure in this country is from the stables, commonly called horse manure, and, take it all in all, it is perhaps the best we could have; but for some crops we would be glad to present a mixture of horse and cow dung.

"Perhaps the first question that presents itself is how to apply manure to the soil so that the crops shall be most benefited. It may seem strange to ask such a question at this time of day, seeing that we are well acquainted with the way it is applied at present, viz., dug or ploughed into the ground. There are certain circumstances which almost compel us to do so, because leaving it on the surface would look untidy. If we take a leaf out of the book of Nature we will find that she manures mostly upon the surface, and if we imitate her we shall not go very far wrong. I am supposing that we give the land only its fair share, and that the manure has not lost any of its virtue. I know it is generally supposed that manure loses certain constituents if exposed to the sun and drying winds, but I have my doubts on this point. I would be inclined to keep it more on the surface than we are in the habit of doing were it not for the appearance and the harbor it gives to slugs. Amongst fruit-trees we always keep it on the surface.

"Seeing that we cannot very well apply it to our crops in a green state we want to know the best way of storing and preparing it without losing any of its properties. I think you will all agree with me that manure is generally anything but well cared for, and indeed seldom undergoes any special preparation. Barrowed or swept out from the stable into the pit or into a corner of the yard it is half ruined on the one hand by excessive fermentation, and on the other by the rain. We once had a pit where the bath-water and closets were discharged, and no doubt it was thought it would be a good thing for the manure; but sometimes we can have too much of a good thing, and such was the case here. We have taken the manure out of this pit, and it looked more like thatch in a stackyard than any other thing; and trying to make liquid manure it would scarcely color the water. I would advise the gardener to get it into his own quarters, and with as little delay as possible spread it on a piece of ground as impervious to water as circumstances will permit. A hole at the lower end to catch any drainings will be found useful. The principal thing to guard against is excessive fermentation. This can be done by pouring a few canfuls of water over the heap, and treading it well. If by chance the heap has got dry the best way is to turn it over, mixing it well, as in making a hot bed, moistening it well as you proceed. If well attended, good manure should be made in from three to four months. I consider it in a fit state for use when it can be cut with a spade. We had last season some treated as described, and at the end of our long dry summer it turned out in splendid condition. Some advise covering their manure heap with soil, to prevent the ammonia escaping. Any benefit arising from this, I think, is doubtful. If well managed, little more ammonia would escape than would in a natural way. It must be conceded that a deal of valuable manure is shamefully wasted in this colony.

"There is plenty of land round Adelaide which sadly wants nourishment. About gardens, too, there is often a deal of waste, such as leaves, prunings, weeds, &c. We cannot keep the rake very well out of the garden, but it is our duty to return what we took away, or an equivalent. Everything that will return into mould should be carefully kept and classified. Leaves will take about two years to rot, so that a fresh heap should be started each season. It is well to see that they are sufficiently moist to assist in decay. The prunings, if not too severely burned, make an excellent top-dressing for orange trees. In burning the heap the flame should be kept as well under as possible, until the mass is well charred; water should then be poured on to extinguish the fire, and a valuable and fertilising heap will be the result. Fowls' dung is excellent manure. However, I think it is better to mix it with other manure than to use it alone; when making liquid manure we generally use some of it. Most of us know the value of guano and bonedust. The latter should be largely used on account of the great percentage of posphates they contain. I think the best way of applying it is to sow broadcast, and dig in with the other manure. Farmers should use this manure largely. Guano, I think, should be applied to the crops when they have well started, but in any case all artificial manures must be used with discretion, or the end in view will be defeated.

◆

"POND."

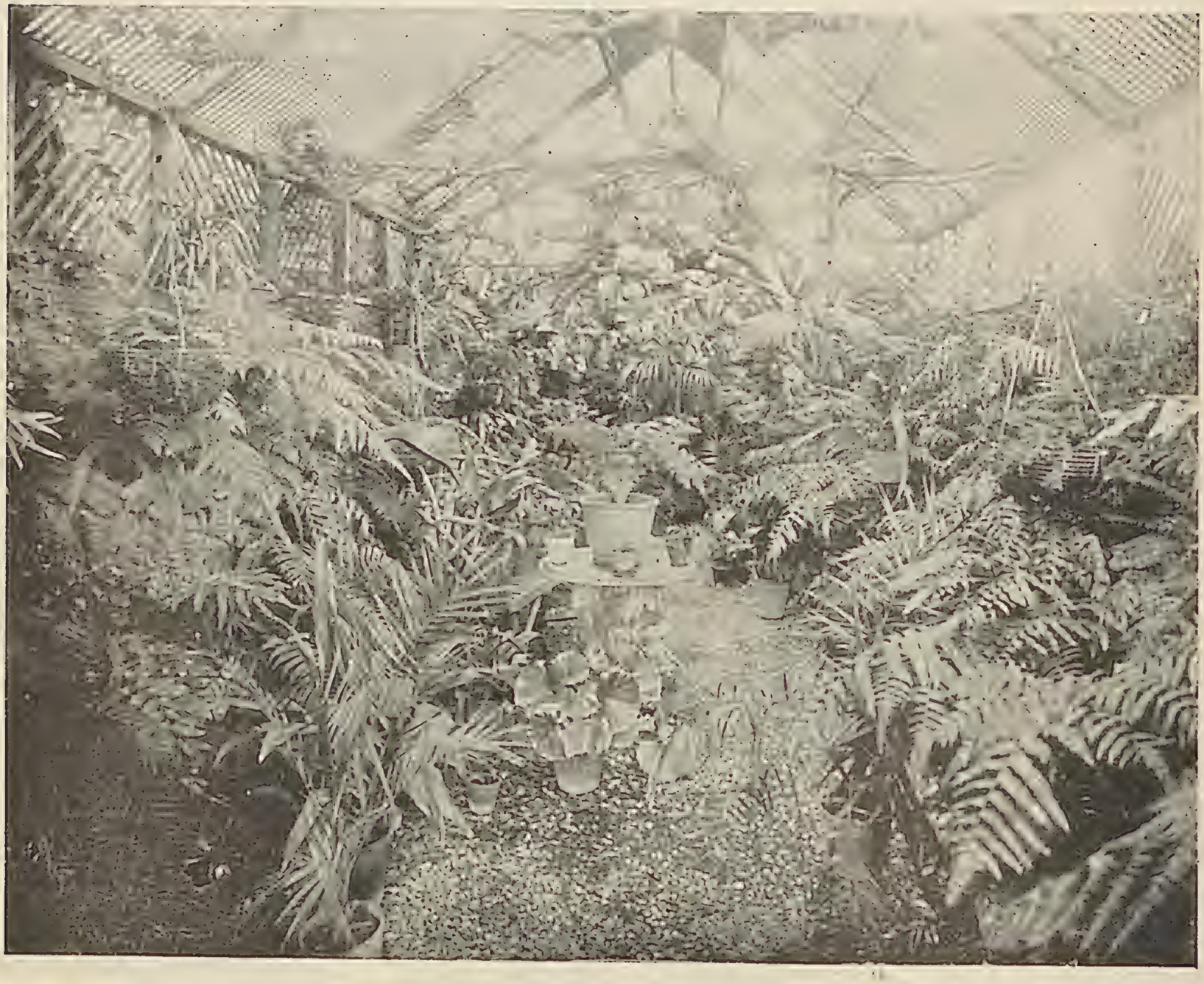
Water Lilies will do quite well with 3 feet of water over the crowns. Build up your burrs to 2 feet with a space in the centre to fill with good loam for the Water Lily, or of a suitable size for a large pot, in which the plant could be placed. Nymphæa Marliacea albida (white), N. M. chromatella (yellow), and N. M. rosea (rosy pink) are all good and cheap. Ellisiana is among the best of the reds. Nothing would give so much satisfaction as Water Lilies.

◆

There is now in the English market a very interesting new Tree Carnation of American raising, the original stock of which was sold for 30,000 dollars. I have not seen it, but description declares it to be a brilliant rose pink, of enormous size, the plant of astonishing vigor and hardiness, while the blossoms grow on erect, tall stems.

"HOMEPARK" LODGE, MAGILL.

THE RESIDENCE OF MR. REGINALD W. WRIGHT.



Mr. Wright's Fernhouse.

The name of this estate is aptly descriptive in so far as the "home" is concerned. No poet has even tuned his musings to a truer note than that which is the dominant tone of this home. Happiness, laughter, merriment, and abundance of all good things are to be found here. The joyousness of healthy, happy children, and the general content of those whose youth seems perennial, defying the cares of time, all combine in the declaration that "Home Park" is rightly designated. The Park, however, gets its glory in a reflected fashion from the surroundings that are part of an adjoining estate, which was the original site of the house and the birthplace of Mr. Wright. It is now the centre of extensive vineyards which have grown upon the erstwhile park surroundings. Mr. Wright was born in the vineyard business, and has continued in it up to the present time, with much success and glowing satisfaction to himself, as his well-nurtured personality amply testifies. Home Park Lodge is situated at the foot of the hills at Magill commanding a superb view of the city to the sea, and in the coastline to the well-known Hummocks at the head of the Gulf of St. Vincent. This is only one of the many charming landscapes to be seen from the foot of the Mount Lofty Ranges overlooking the Adelaide Plains. On a clear day the view is worth a long journey to see; the sunsets are such as would delight the eye of an artist, who fain would transfer them in pigment to canvas, and as the clouds of darkness stretch over the city below the lights of Adelaide twinkle and shimmer like a thousand diamonds. So that in daylight or dark, fair weather or storm, the growing green of winter and spring, or the changes to brown, under the summer sun, all give a variation of scenery that ever makes Home Park Lodge a pleasant rendezvous to visitors.

The house of considerable proportions, built under the artistic skill of modernised architecture, is surrounded by a large area of vineyard, and orange and lemon groves. Flower gardening is not a strong feature of the home surroundings, although the beds around a very spacious lawn are filled with a good selection of flowers, and some fine varieties of roses. The lawn of Couch Grass covers an area of about a chain and a half wide by two chains long. This is the sporting ground for the children with their ponies and dogs, and where their birthday parties are held, and at times placed at the disposal of some local charity or church bazaar, in which Mrs. Wright finds pleasure. In fact, Home Park is rightly named, if for no other reason than that the philanthropy of the host and hostess makes it a kind of hospice for the needy. Mention should not be omitted, too, of the fact that both the host and hostess have musical talent strongly developed, and many are the pleasant musical evenings enjoyed by privileged visitors.

The wine cellars are where Mr. Wright is usually found, but maybe the visitor or man on business will find him laboring in his vineyard or lemon grove with all the energy and strength of a trained farm laborer. But besides being a vigneron and gardener, he is by Nature's gifts a mechanician, his skill being turned upon an up-to-date electrical plant, with which he lights up his cellars, stables, coach-house, and all the dwelling-house both inside and out. With his electric lighting in full glow the place might be easily mistaken on a dark night for an Arabian Night's palace.

The part of the estate where our representative found himself most interested was in the fernhouse, of which we give a picture. This is situated on the western side of the house, and is built of slats, with a V-shaped roof. It is of fairly large proportions, and the prettiest view of it is at night, when lighted by electric fairy lamps, and the water sprays, fountain, and miniature falls giving a dancing sheen to the fern fronds, the climbers, and the more massive foliage. A central path gives footway between tiers on either side reaching well up to the eaves. In the tiers rocks are tastefully arranged, and at the end is a labyrinth of rockery, containing fish ponds. The rocks, too, are not made of cork, but genuine boulders won from the adjacent hills, some of them containing clear cut crystals, which scintillate their prismatic colors in keeping with the general living activities of their surroundings.

The fernhouse is the special pleasure of the hostess, and this fact gives additional interest to the well-furnished contents. Upon entering the door the light is switched on, and our picture reproduces on the righthand side a good specimen fern, Polypodium glaucophyllum, with a Phoenix reclinata palm directly underneath, while above it is a Nephrolepis exaltata, showing up well, as its name implies. Hanging above this again is a well-furnished basket of Adiantum cuneatum grandiceps, and against the lattice work an Asparagus plumosis is winding its fern-like tendrils. Facing this, and giving in season as good coloring flowers, is an Epiphyllum. A rustic basket of Nepholepis exaltata is not looking too happy, but counteracting this deficiency is rather a nice rich green Aspidium elegans below it, and another of the same variety above. Quite a collection of Adiantums and Aspidiums fill up the benches to the far end corner, where a Staghorn is not given a fair chance to display itself; but its complementary piece on the opposite corner is a much better specimen, showing to a greater advantage. Within the pretty little grotto work, and dipping in the little limpid pools, where golden denizens desport themselves, to the delight of the children, is a good specimen of Kentia Forsteriana, giving a pretty relief to the picture. Hanging above is a basket of the graceful Maidenhair (Adiantum cuneatum), backed up by Nepholepis and a fine spray of Asparagus plumosis.

Turning to the left we notice, amongst others, a good specimen of Aspidium elegans, and above it the variegated form of Phylangium. Many of the plants already mentioned hide the tiers, but as we pass along there in hiding are noticed two specimens of Peteris cretica alblinneata and Pteris longifolium, and gaily spreading itself over the rockwork is Cyrtonium falcatum, also hiding from full view a Staghorn. At our feet is a pair of Phoenix reclinata, and a little group of Aspidistra, forming a background to the specimen pot-plant of Ligularia Kaempheri. The table in the centre is built of rocks in rustic fashion, with a marble slab top, mounted by a potful of Adiantum, with Primulas grouped around to give a relief of delicate coloring.

A rustic seat is inviting, but time presses hard upon sentimental longing, and we are hoping on another visit to see more attention given to the flowers outside, although, be it said to her credit, Mrs. Wright had a really fine display of Chrysanthemums in the season.

CHRYSANTHEMUMS.

Commence feeding the plants with soot water as soon as the pots are fairly full of roots. To ascertain their condition, turn out a few plants and examine the roots. Place 1 peck of soot in a barrel containing 40 gallons of water, stir the bag to and fro every day for four days, then use the water in a clear state. Liquid manure from a farmyard, used in a diluted state, 1 gallon to 5 gallons of clear water, is a good stimulant; also artificial manures, given according to directions with each. The buds should be "taken" when they are just free of the side shoots around them. The crown buds which did not open properly were probably "taken" too early.

PETUNIAS.

Cease disbudding Petunias 10 days before the flowers are required, allowing rather more for double than for single varieties.

HOW TO BEAUTIFY THE CONSERVATORY WITH CLIMBERS.

A conservatory is not properly furnished if it does not contain a few climbing plants. Every glasshouse of this description should afford a little shade to the owner during the hottest months of the year, and such shade as is provided by roof plants is always most agreeable.

Climbers growing under the roof glass obviate the necessity of applying artificial shading, and nearly all these pretty plants do well themselves by being fully exposed to the sun. Most climbing plants thrive best when they are growing in borders, but in all houses it is not possible to form such borders; therefore a substitute is found by using tubs or boxes neatly painted on the outside, or large flower pots.

Two large pots may be used as follows: Fill one with good loam, after properly crocking it, and place it in position; then take another about the same size, and first knock out most of the bottom, fix it on the soil in the other pot, and proceed to also fill it with similar loam. The top pot is to contain the plant. The roots will soon take possession of the soil in both pots, and where there are dark corners the plant growing in the top pot will make sturdy shoots instead of weakly ones, because it is thus raised up nearer to to the light.

The pendulous growths of climbers look charming, and pillars, to which some of them may be trained, are fit objects to be clothed with these plants. A conservatory interior is not so bare looking, and a small structure is made to appear larger than it is by the presence of pillar plants and climbers on the roof.

The training of these plants should always receive attention; stiffness must be avoided, yet neglect to thin out branches sufficiently will result in tangled masses.

The compost used should be of a lasting nature, because it is not so easy to renew it in borders, tubs, and large pots as it is in small pots. Climbing plants, too, cannot be so readily removed. Top-dressings can always be given, and established plants are much benefited by the addition of fibrous loam, leaf soil, and sand. Occasional syringings and spongings with clean water will assist in keeping the foliage clean and free from insects.

These are grand plants for the purpose, namely, Cobæa scandens and C. scandens variegata, nearly always free from insects and rapid growers; Tacsonia Van-Volxemii, crimson hanging flowers, very beautiful; Plumbago Capensis (blue) and P. Capensis alba (white); Heliotropes and Fuchsias, fine for pillars; Clematis indivisa, flowers in late spring; Jasminum grandiflorum, Swainsonias, and Roses Niphetos, Climbing Devoniensis, Madame Berard, Climbing Belle Siebrecht, Madame Pierre Cochet, Marechal Niel, Reine Marie Henriette Belle Lyonnaise, Cheshunt Hybrid, and Souvenir d'un Ami.

ROSES.

VARIATIONS IN ROSES.

The question has more than once been asked if Roses did not deteriorate. I do not think a variety loses in quality if due care and selection be exercised when propagating If we increase from bad or indifferent wood, it is only reasonable to expect a Rose of poorer quality. Certainly this will be the case until the plant has succeeded in gaining strength and vigor, with more healthy constitution. Another cause of deterioration lies in propagating from a plant showing the variations I will endeavor to point out. That selection has great influence upon stock we have ample proof both in the case of vegetables and flowers. Then why not be more careful as regards the many varieties of Roses? For example, we have that grand Tea, Maman Cochet, which generally gives us a fine shade of flesh-colored rose, more or less suffused with carmine and salmony yellow, always clear and opening well when coming as described above. But we now and again get what may be called a bad type of this. The flower is of similar size and form, but the fault lies in the petals being much thinner, the color pale and dull, the flower opening badly. It is not that we get an occasional bad blossom upon the plant, but all flowers upon that plant are equally indifferent. I have found it so in cases where I am positive the buds were taken from Maman Cochet, so that it cannot be put down to mixture of varieties. If we select buds or grafts of this variety indiscriminately, we run great risks of perpetuating the bad type. I am not alone in this contention, for, if my memory does not deceive me, Mr. C. E. Cant, of Colchester, holds the same view as regards bad types of this and other Roses. I hope none of my readers will for one moment imagine I am disparaging such a grand Rose as Maman Cochet. I could not do so when I have its beautiful blossoms under glass at the time of writing, and bear in mind the many ideal blooms seen during the past three summers. But let us be more careful in selecting the propagating material.

If we turn to another grand Tea of older origin (1871), we find a similar variation. I allude to Comtesse de Nadaillac. I am acquainted with more than one instance where plants of this Rose have produced such indifferent flowers that they were useless. It is not an occasional blossom, but the whole of those upon that plant are the same, notwithstanding they were side by side and had the same treatment as others which produced superb examples. It is the same with Souvenir d'un Ami and several others. Then we find Perle des Jardins varying in form more than color. A plant will persistently put forth flowers of perfect form, whether they be large or small, while a second plant just as regularly produces blooms with split centres or so globular that they do not open freely.

Until I had given the subject some close attention I was under the impression it was only an occasional or chance flower which had these defects, but am now convinced that some plants produce them so persistently, as to call for extermination if we are to have a stock that can be relied upon to give us blossoms of these varieties in their best form. I have found Marie Baumann, Duke of Wellington, Xavier Olibo, Dr. Andry, and a few more Hybrid Perpetuals vary in the same way. It is not due to the season or weather, otherwise why do we find the better quality flowers upon neighboring plants? Nor is it the same kind of variation we find in Comtesse d'Oxford, Mme. Lambard, William Allen Richardson, Anna Ollivier, Marie van Houtte, l'Ideal, Beaute Inconstante, and others, which are naturally changeable without being of indifferent quality. It would be interesting to know if others have observed these variations, and if so, to what extent and upon what varieties. None of us would think of propagating from plants of indifferent character if we knew such to be the case, and I feel sure we could secure a more reliable stock of many varieties if a little more attention were given to this subject.—A. Piper, in "The Garden."

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ROSE NOTES FROM "THE GARDEN."

Rose the Bride as a Pot Rose.—I consider this a most useful Tea Rose for growing in a pot to obtain early flowers. I am aware Niphetos has many good qualities, but in shape I consider The Bride superior. I grow several kinds in pots.

Striking Rose Cuttings.—Where plants for indoor use are required, such as Marechal Niel and other Teas, they may be produced in plenty by dibbling the cuttings in rather thickly into 5-in. pots and plunging in strong bottom-heat. The roots soon form, and top growth is also quickly made. The cuttings may be about 6 in. in length of dormant wood from indoors, and they should have the bottom eyes pinched out. As soon as the cuttings are rooted, the pots must be lifted out of the plunging material and the plants potted singly a few days afterwards, shading them until the young roots are getting well into the compost, when they may be very gradually inured to less heat and moisture. While rooting the cuttings must never be allowed to get dry, and they must be inserted round the edge of the pot only. When established in their pots, they must be cut back rather freely and the resulting shoots taken up singly if required for long rods, or as many as are needed to form the desired shape of plant.

Rose Mrs. Pierpont Morgan.—For two years I grew a small quantity of this Rose. It was not a great favorite, for some unaccountable reason, with the city retail florists. I do not encourage retail trade, catering exclusively for the wholesale trade. Some persons will drop in, however, occasionally wanting flowers, and because the dealers in Philadelphia did not take very kindly to Morgan, this was the Rose offered to retail customers. So well did it please them that I secured orders for delivery at regular intervals—twice a week. In addition to its other good qualities it is an excellent keeper. These customers frequently remarked that the flowers when three or four days old were still in good condition, and when the fresh ones were delivered the older ones were forwarded and presented with evident great pleasure to some less fortunate person who did not have flowers often. For this reason, if for no other, Mrs. Pierpont Morgan ought to be grown to a greater extent than it appears to be, especially in the smaller towns where a florist is a combination of grower and retailer.—L., in "American Florist."

* * *

CLIMBING ROSES.

Recently I saw a very novel idea carried out, and one which I think might be followed to advantage. A large sandstone wall at the bottom of a garden was planted with choice climbing Roses. As the wall faced due south and the north and northeast parts of the garden were sheltered, it can readily be imagined how warm and dry the border would be. So hot was it during the past three summers that the Roses were far from satisfactory, being parched and baked in spite of free root waterings. I now see that a quantity of Oak cordwood has been laid upon the border, many of the long shoots of Roses being brought down and fastened to this. The border is about 2 ft. wide, and has been well manured. There is still an ample supply of wood upon the wall, although enough has been removed to clothe the logs as soon as the rods break into growth. That the Roses grew well last autumn will be evident when I say there were shoots of Crimson Rambler 10 ft. and 12 ft. long, while Climbing Perle des Jardins had 14 ft. of sound wood. I have never before seen a climbing "Perle" in such grand form outdoors. Other varieties are William Allen Richardson, Climbing Niphetos, Marechal Niel, &c. The idea was that if it turned out too hot for Roses upon the sandstone wall, the shoots upon the logs would take a larger proportion of the sap.

In the same garden are some stumps of old fruit trees, and around these are Crimson Rambler—one plant had upwards of a dozen long shoots, some of which had reached the top (10 ft.) and still spread out another yard or so—the Hybrid

Sweet Briers and the stronger growers of the Ayrshires. What pretty and natural pillars these will make can readily be imagined by all who know their habit of growth. They are not tied in close to the stumps, but allowed to grow almost at will, and will not be pruned. Roses are a great feature in the garden referred to, but none are grown in formal lines or secured to stakes in the stiff and formal manner we so unfortunately meet with in most cases.

—RIDGEWOOD.

DWARF HEDGE BRIERS FOR TEA-SCENTED ROSES.

After a long experience among all stocks I am convinced that very dwarf hedgerow Briers give the best results both in quality of flower and in vigor of plant. In a two or three year old hedge Brier obtained with all its fibrous roots we have a sap producing power unequalled in any other stock. Such Briers may be budded level with the ground, the lower the better, and provided the soil is good ,some fine plants will be the result. Tea Roses upon such Briers planted at the foot of walls in a rich, well-drained soil would give blossoms of surprising quality.—P.

ROSE SOUVENIR DE MME. EUGENE VERDIER.

This Rose has the rather unusual trait of yielding buds and expanded blossoms of totally distinct colors. Its pretty buds are of a clear saffron-yellow, and in the forcing house this color is very pronounced, but the expanded blossoms are almost pure white, and have a great similarity to those of the Hon. Edith Gifford. The exquisite form of this latter variety is almost repeated in the Rose under notice. Like the majority of the Hybrid Teas, its flowers are borne on good stiff stems. I can confidently recommend this Rose, and I believe it will prove to be one of the most useful that its raiser, M. Pernet-Ducher, has given us.—P.

PEGGING DOWN ROSES.

One rarely hears of this system giving satisfaction. In my opinion it is overdone. Rather than peg down the whole of the branches, a much better result is produced by pegging down, say, two or three of the growths of a good vigorous kind, allowing the remainder to grow in their usual manner. Last summer I saw a bed of Grace Darling thus trained, and it was decidedly successful. Many of the grand Hybrid Teas and Perpetuals, such as La France, Viscountess Folkestone, Mrs. John Laing, &c., are amenable to this treatment, and sometimes a growth may be layered during the early summer months which would give a very useful own-root plant to fill up a blank the following spring.—P.

LONG-STEMMED ROSES.

Many gardeners are doubtless often sorely pressed to meet the requirements of their employers for long-stemmed Roses in the Rose season. The demand for large showy Roses of the type of Mrs. John Laing with long stems exhibits no sign of diminishing, and for a gardener to keep up the supply entails a severe strain upon his plants unless he takes precautions to obviate it. To cut several branches, say 2 ft. long, from a plant in the growing season must considerably impair its vitality. What I would suggest is that gardeners should set out a portion of the kitchen garden for this purpose and have a double set of plants to cut from, giving each set alternately a year's rest to recoup their vigor. There is no reason why a gardener should not be able to produce flowers as fine in quality as he can purchase from the growers. A well-manured kitchen garden soil is just the one for them. Set out the plants in rows 3 feet or more apart, give liberal dressings of farmyard manure, supplementing those with bone-meal. Keep the soil well cultivated, and fine, vigorous shoots will be the result. As pink and blush Roses of the H.P. and H.T. classes are most in request for table decoration, the following kinds should be grown in large quantities: Baroness Rothschild, Belle Siebrecht, Captain Christy, Caroline Testout, Clio, La France, Mme. Abel Chatenay, Mme. G. Luizet, Mrs. John Laing, and Spenser.—GROWER.

ROSE ARBOURS.

There is surely no end to the uses to which one can put the queen of flowers! On every hand we see beautiful Roses as hedges, on pillars and arches, clothing banks and tree stumps, and, last but not least, forming arbours beneath which we may get grateful shade with delightful fragrance. There may be difficulties to contend with ere the arbour is perfected, but this adds zest to the pleasure and enhances the interest in the garden. We cannot have too many Roses, and those who have not yet set about the formation of a Rose arbour might well prepare their plans and be ready to plant in autumn.

It is thought by some persons that such a use for the Rose must of necessity be restricted to extensive places. They erroneously assume that a considerable area of ground must be covered, and that a way should be had all round the arbour. From this view I most strongly dissent. On the contrary, it is contended that the Rose arbour should be the appendage of every garden in which Roses will grow. True, it will not always be feasible to have a big one, but accommodation on fence or wall is always available, and a most charming retreat is easily provided.

One of the disadvantages of Rose culture lies in the fact that the plants want as much fresh air as it is possible to give them. This means that in small gardens which are enclosed by wood, brick, or stone fences Roses can never be induced to flourish in a thoroughly satisfactory manner, simply because of the lack of the vitalising influence of fresh air. In such gardens the Rose arbour is the form of culture that must be adopted, as the very fact of the grower having, to give head room, to carry his plants above the fences, ensures a vastly increased amount of light and air, and we may have Roses where hitherto Roses have declined to grow. Now they luxuriate; before they merely eked out an existence. Who, then, would not have an arbour, when it will provide delightful blooms of the ever beautiful queen of flowers?

The necessities are simple, consisting of a framework, which must be erected according to individual taste and convenience, and always to harmonise with its surroundings; good soil; suitable varieties. Here are three things all within the control of the grower. The natural soil may not be suitable for our purpose, and we must perforce import that which is good. If 1 yard square of bad mould be removed, and its place be filled with sound loam over proper drainage, our troubles soon melt away. A rampant growing Rose, like Blairii No. 2, for example, will be an annual source of delight, and will, when establishment is complete, bear abundant crops of handsome flowers.

Strong plants should be procured at the outset, and every chance ought to be given during the first season to the roots—the better the base, the better the superstructure. If the plants are encouraged to rush forward the top growth before the roots have taken a firm hold upon the soil, the ultimate results are never as satisfactory as when the motto has been, "Hasten slowly." If the framework be of galvanised iron wire, it may be given two coats of good paint: more especially is this important in the neighborhood of manufacturing towns, where the atmospheric gases affecting the wire are often disastrous to success. With due and careful attention the Rose arbour will be a constant pleasure to its owner and delight to every visitor.

CLEMATIS.

Take a lump of lime, dissolve it in water, stir thoroughly, and when clear apply to the roots of the plants. This is beneficial to Clematis and obnoxious to worms. If it fail, use 1 oz. of petroleum in 3 gallons of water, stirring thoroughly, and apply a thorough soaking to the roots.

HARDY PALMS.

To give a richness and dignified appearance to a garden there is nothing to compare with Palms. They hold their own anywhere in a garden, but especially attractive on lawns. Kentia Belmoreana is one of the choicest of the group and is generally found in almost any conservatory. Some of the varieties are hardier than others, and it is those which can most resist moderately cold weather that are to be recommended. A list published in a recent number of the "Citrograph" (a Californian paper) give some useful information as to the sorts to be chosen.

Areca Baneri (Seaforthia Robusta)—A very hardy variety, with large handsome leaves.

KENTIA BELMOREANA.

Areca Lutescens—A species with yellowish green stems and palm-like glossy foliage; will stand light frost only.

Brahea Filamentosa, also known as Pritchardia filma and Washingtonia filifera. This is the hardy California fan palm, too well known to need description here. It is found on the Colorado desert, and has attained a height of 75 feet. A fifty-year-old specimen in the City of Los Angeles is 58 feet in height, and one in San Bernardino 22 years old from the seed, measures 32 feet. It is presumed that with careful cultivation these palms will make a much more rapid growth, and as vast numbers have been planted in recent years they will soon be very prominent features in the Southern California landscape.

Chamaerops Canariensis

Chamaerops Excelsa—One of the hardiest of fan palms, attaining a height of 20 feet. Native to Southern Japan and China.

Chamaerops Humiles—A dwarf fan palm, a native of Southern Europe. This is said to be the variety from which the fan is made.

Cocos Australis—A hardy palm from South America, with long, slender foliage.

Corypha Australis—A fine variety from Australia, attaining a height of 100 feet. This will stand a medium frost.

Chamaerops Martiana—A fan palm from Nepaul. Often growing to a height of 50 feet.

Cocos Campestris—Quite hardy, and valuable for outdoor decoration.

Latania Barbonica—Moderately hardy, bright, glossy green foliage, and one of the most popular palms in cultivation.

Phenix Dactylifera—The date palm of commerce, quite commonly planted here.

Phenix Canariensis—A fine hardy palm from the Canary Islands.

Phenix Canariensis, Macrocarpa, Phenix Sylvestris, Phenix Tenuis, Phenix Pumila, Phenix Reclinata are all varieties of date palms and hardy here.

PHŒNIX RECLINATA.

Sabel Adansoni—The dwarf palmetto of Florida.

Sabel Palmetto—The cabbage palmetto from the gulf and Atlantic coast of the Southern States and Bermuda Islands, sometimes attaining a height of 90 feet.

Washingtonia Robusta—Similar to the Califorinia palm, but more compact and dwarf.

Brahea Glauca—A very ornamental fan palm from Mexico. Leaves bright green, glaucous beneath.

Brahea Edulis—A new and showy palm from Guadaloupe Island.

The seeds need to be planted as soon as received, and if fresh they will germinate readily, and in one year's time make plants ready for the ground. The most inexperienced amateur can grow them with little trouble, and there seems to be no reason why hardy palms of varied kinds should not adorn the streets, avenues, and homes of the settlement.

SEEDS WHICH SHOULD NOT BE SOWN FRESH.

(From the "Revue Horticole.")

By Jules Rudolph.

In a book published anonymously in the year 1765 I find the following passage about Stocks:

"Many amateurs and professional gardeners are certain that Stock (Giroflée) seed kept for five (5) or more years give a larger percentage of doubles than fresher seed. Taking for granted that this is really a fact, the reason is that the seeds which can only produce single Stocks decay, losing their germinating power sooner than the others. So old seed will, in fact, produce fewer plants, but of the plants produced there will be a greater percentage of doubles."

How far can we now believe this statement, made as long ago as 1765? According to traditional belief it is better to use for some vegetables and flowers seeds from two to five year old. Why? Old gardeners say that new seeds produce plants less shapely, running more quickly to seed, and of such vigor that they do not preserve all their true characteristics, while seeds two or three years old give more shapely plants, with less tendency to run to seed. I believe in this, and will try, if possible, to explain it.

All plants, or, I should say, most of them, have the power of reproducing themselves from seed, with their own characteristics, but at the same time they are influenced by atavism, which tries to make them revert to the specific types from which they came. Thus in the seed of some varieties two forces struggle, the one tending to make them revert to the primitive type, the other tending to reproduce certain acquired characters more or less fixed by selection. It is possible that this atavistic force weakens with the age of the seed, as also that abnormal vigor which makes certain plants run to seed if grown from seeds too fresh when sown. This is not the case with Stocks. If we admit that double flowering of these plants is a weakness of degeneration, it is easily believed that seeds some years old no longer possess their pristine vigor, and can produce a double flower instead of a single. We have here a real transformation of the seed, a transformation which can be allowed if we remember that the less Stocks are let run wild the more chance one has of obtaining double flowers. It is for this reason that Stocks are grown in pots in Germany. In this way a much larger percentage of double flowers is obtained than in the case of plants grown in the open. Many growers prefer to use China Aster seed one or two years old, saying that by so doing they get more double flowers. But above all it is in the kitchen garden that it is necessary to know whether to choose young or old seed according to the species or variety. Thus, for beetroot and carrots, seed two years old should be used to let the root form better and keep the plants from running. For chicory and cabbages three-year-old seed, as then the plants shoot and ripen better. If we do not wish to let spinach, lettuce, or radish run to seed or differ from the type we must use two-year-old seed. For corn salad it is necessary to use seed at least a year old, as seed gathered in June will scarcely grow if sown in the following September or October.

In the "Good Gardener" for 1829 gardeners are recommended to sow melon seed several years old, the same rule applying to the other cucurbitaceæ.

For early sowings of turnips it is necessary to use seed several years old to prevent the plants running to seed. The influence of time on the germinating value of seeds appears then to be a well-established fact, and, perhaps, it is hardly possible to account for this influence otherwise than by the theories I have put forward.

R.

GATHERING AND KEEPING FRUIT.

The less fruit is handled the better it will keep. The bloom on the skin is its natural protection, and this should not be rubbed off; neither should the fruit be gathered when it is wet with rain or dew. Bunches of Grapes should have a small piece of the branch attached to them, and the berries must not be marked with the fingers. Melons must be supported as they grow on the plants, so that they will mature naturally and not fall off the plant prematurely. They are ripe when the aroma from them is very perceptible, the skin at the base easily indented, and when it begins to crack around the stem.

Peaches and Nectarines are ready when they part from the branch upon being slightly pressed at the base; never squeeze the sides between the thumb and fingers. Gooseberries, Currants, black, white, and red, ought to be gathered before they are really ripe, or the berries will be injured through being soft, and the Currants, in addition, will fall from the stems.

Apples, Pears, and Plums should part from the tree easily when the fruit is gently brought to a horizontal position. The Fig is quite useless unless it is ripe when gathered; the skin should be cracked in several places and juice filling the eye of the fruit. When in this condition it requires most careful handling.

All ripe or ripening fruit should be kept in a dry, airy, cool room. Extreme fluctuations in the temperature must be avoided. Unripe fruit on trees in houses may be hastened forward by giving extra heat, but it is best to allow the crop to mature without undue forcing.

Strawberries and Raspberries will not remain good for many hours after they are ripe, so that it is wise to gather them just before they are really ripe. All fruit, if possible, should be gathered with stems attached, except Peaches, Nectarines, and Apricots.

In staging fruit, whether it be in single dishes or in collections, always use a few leaves of each kind for garnishing purposes. Use shallow plates or dishes, not deep ones. Have the specimens in every dish as nearly of one size as possible. Set up the largest kinds, at the back, and the smaller ones in front of them. Do not polish a single fruit.

ESSENTIAL POINTS IN SELECTING AND EXHIBITING FRUIT.

The final selection of the specimens is a matter of the utmost importance. An exhibitor may have plenty to choose from, but unless he knows which are the best he may make some fatal mistakes. A farmer, when gathering the ears of wheat for show purposes, does not select the largest, but travels all over his field picking out here and there the ears which are of good average size, plump, and well filled with grain, clean and symmetrical, so that when they are put together they all appear alike, and make a perfect bunch.

It is the same with garden produce, the largest specimens are not always the best. In fruit we must have flavor, color, shape, and soundness.

A USEFUL VEGETABLE.

Celeriac, or Turnip-rooted Celery.—This is a useful winter vegetable, but it is not so largely grown as it deserves to be; its value has long been recognised on the continent, and quantities are annually imported into this country, which always find a ready sale and realise good prices. The flavor is very distinct from that of Celery, and makes a most welcome change. The cultivation is simple; it will thrive luxuriantly on almost any well-prepared soil. The seed should be sown thinly in pans, and the seedlings pricked out as soon as large enough to handle—treated, indeed, precisely in the same way as Celery, and later on transferred to their summer quarters. A south or west border should be selected if possible. Trench the ground or deeply dig it during the winter; no trenches are required, as it should be grown on the flat. Break the surface up before planting, make quite firm, and rake down level. Lift and plant with a trowel, allowing 2 ft. between the rows and 18 inches from plant to plant. Like Celery, it is a moisture-loving plant, and should be kept well supplied with both clear and liquid manure water during dry weather, keeping the soil constantly stirred with the hoe to promote a free, quick growth. Lift the roots before frosty weather sets in, trimming off the leaves and store in sand or ashes in the root room, when they may be taken out as required.

EDWIN BECKETT.

THE FIRST TOMATO GROWER.

A good deal has been written about the Tomato of late, and speculation as to its successful culture outdoors in England (says "The Garden") is being discussed; but the culture of the Tomato as a vegetable in this country, either indoors or out, is not such a recent affair as some seem to think. Tomatoes were grown both indoors and outdoors at Drumlanrig Castle, in Scotland, at the time of the Crimean War, about 1853 or 1854, by Mr. James McIntosh, the gardener there at that time. The reason probably was that Mr. McIntosh was rather fond of trying novelties. He grew, about the same time, good crops of Passiflora edulis, and, I think, P. quadrangularis, the Guava, the Egg-plant, and tried the Vanilla, but did not succeed in fruiting it. The Tomatoes were grown abundantly over the paths in the pine-stoves, and large quantities were gathered. They were then so acceptable to the cook that an attempt was made to produce a late supply out of doors. The plants for that purpose were grown on like the Dahlias in pots and planted out in May against a close wooden paling about 200 feet long. They fruited, but few of of the fruits ripened thoroughly, and about October the plants were pulled up with the partly ripened fruit on them and hung up in warm sheds to ripen.

I forget the botanical name of the Tomato then, but it was not "Solanum," and it was called the "Love Apple." The fruit looked so tempting that the writer was once induced to taste it, but he never bit another for a dozen years at least. Afterwards, when near Edinburgh, no Tomatoes were grown in any garden near there that I knew of, nor was it till long after that that it became common. Nowadays it is as common as the Potato, and is in every greengrocer's shop and on every hawker's barrow.

J. SIMPSON.

PLANTING POTATOES.

The following method of planting potatoes is very successful:—"After cutting the tubers, leaving not more than two eyes, cover them with soot and leave them a day to dry. After planting hill them immediately, so that there is no more treading among them. On digging the crop, the old sets will be found to be perfectly sound. Unless the season is very wet, germinate all vegetable seeds under a wet bag, taking care to shade the young plants when the bag is removed.

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SCIENTIFIC.

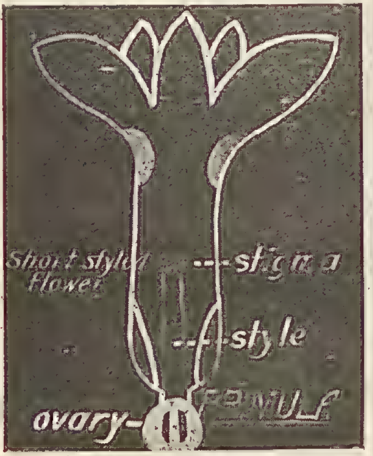
FERTILIZATION OF FLOWERS.

[By Sigma.]

II.

Fig. 2.

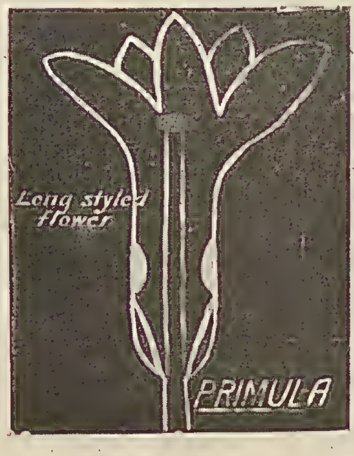
The Primrose flowers are in two forms—one short-styled and the other long-styled. Supposing a bee gets dusted by the pollen of a long-styled flower whose anthers are low down, when it visits another flower and works in the same position the short-style is exactly in the right position to brush off the pollen on to the stigma. Coming out of that flower again, the anthers (being near the top) load it again with fresh material for another flower.



In the Geranium the anthers surround the stigma, which, however, is sealed up till later, and, after shedding their pollen, lie flat down on the petals out of the way. Now the stigma unfolds its sticky lobes, and whatever part of the insect was in a position to receive pollen before now parts with it for the benefit of the stigma.

Fig. 3.

In the Nasturtium the honey is in a long spur. Hairs on the corolla tube prevent the insect from going in the wrong way; it is also guided by strong markings. First, two anthers turn upwards and obstruct the entrance to the tube for the insect to dust against. These having performed their duty turn downwards out of the way; two more turn up; and so on for seven days, after which the pistil, which was hidden away in the top of the tube, bends down, and is ready for the next visitor.



The Pea tribe are well worth studying. The flowers are very irregular in shape, and the petals are so balanced and interlocked that when a bee alights on the lower one the anthers are suddenly shot out from their hiding place. In the Genista (or broom) quite a violent expulsion takes place. In some cases the flower is so arranged that the bee must enter upside down—a favorite position with some bees.

Fig 4.

In the Chrysanthemum the anthers are at the top of the flower tubes; the unripe stigma growing upwards acts like a piston, and sweeps all the pollen out, but not till later do its lobes expand ready for fertilization.

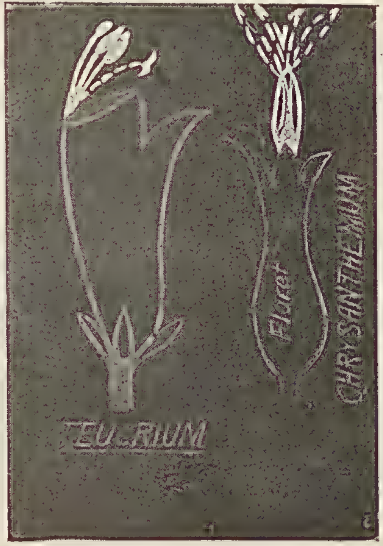
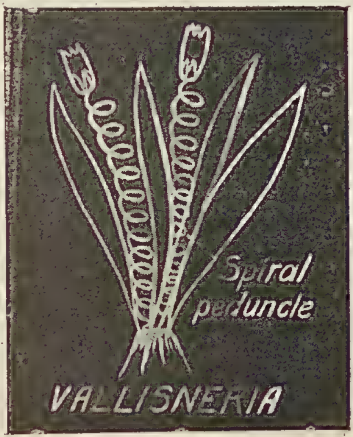


Fig. 5.

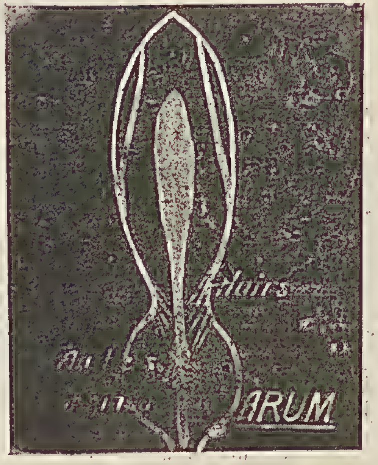
The Dandelion is said to have no less than 93 distinct species of insects visiting it.



The Vallisneria (an aquatic plant) is peculiar. The female flowers float on the top of the water, and are attached to a long spiral stem, which lengthens or shortens according to varying depths of water. The male flowers are stemless. They grow at the base of the plant until ripe, when they become detached, float on the surface, and are blown into contact with the stigmas of the floating flowers.

Fig. 6.

Perhaps the most ingenious arrangement is to be found in the Salvias. The anther has become of very peculiar shape; the two lobes have spread, forming a long connecting bar. At a short distance from one end this bar is pivoted to the filament. The lower lobes of the anther are expanded somewhat, and completely block the entrance to the corolla tube. A bee thrusting its head in causes these arms to overbalance, and the anthers are brought down in contact with its back. If it visits another flower which is more matured the long pistil is curved down into exactly the position most suitable for picking up the pollen on the bee's back. Any pollen picked up by the head of the bee from the lower lobes of the anther would be wasted, so in course of time these obstructing lobes have become abortive, i.e., they produce no pollen. Another peculiarity of the Salvia is to be seen in the lower petal on which the bee alights. It is strengthened by ribs or cords in order to carry the weight of the bee. These stiffeners are exactly in the right place mechanically to take the strain.



(To be Continued.)

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PRETTY VASES.

In the centre of each vase there is a pink Begonia, then a row of blue Lobelia, outside of all mixed Verbenas, which are simply a mass of color. In front of the vases I have a small piece of ground 12 ft. by 6 ft. full of mixed single Begonias with an edging of Lobelia. At the back, near the vases, I have also a row of dwarf summer Chrysanthemums which are full of buds. The Begonias are a mass of bloom. I think the Begonia has a great future before it. It is so nice to take them up in the autumn, store away for the winter, and start them again in the new year.

—A Sailor.

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The Flower Garden.

OPERATIONS FOR AUGUST.

COMFORTING REMARKS FOR THE INEXPERIENCED.

Many a person on first seeking to embark upon the tempestuous waters of gardening is so abashed by the many formulæ laid down in the text books on the subject, implicit adherence to which is put forward as the only means of attaining success, that he hesitates to book a passage on the good ship Horticulture, and either abandons the idea in disgusted despair, or contents himself by dabbling in the spray near the shore. To such my remarks shall be chiefly addressed, with a view to showing that much which is written in the horticutural press may be conveniently ignored by the man who, unencumbered by too idealistic ideas, seeks rather to find pleasure among flowers and plants than to use them as a means of gaining fame and distinction.

It is not given to many to see the horticultural scribe at work in his garden or greenhouse, but I can assure my readers that in his methods he is frequently a totally different personage from what his writings would lead one to expect. Instead of a conscientious observance of those trivialities on which he so emphatically lays stress in his book, here we see a total disregard of them, and only the broad general principle underlying them practised. Thus, he may be a staunch advocate of filling a flower pot a sixth part full of drainage—in the press. At home he frequently dispenses with drainage altogether, especially in the summer time, and relies upon a portion of peat fibre, moss, or partially decayed dung to prevent the egress of the soil, and retain water long enough to allow of the water can having a rest sometimes.

Publicly he shudders at the thought of allowing the water used in syringing to come into contact with a plant in blossom; in his greenhouse does he remove such before subjecting the general occupants to their daily douche? Oh dear no! True, he does not fire his watery cannon point blank at them, but they get wetted all the same. Of course, in winter, the only time when wetting the flowers can do much harm, or when the summer sun is shining directly upon the blossoms, he does not syringe at all, but waits until the turn of the tide which, with plants as with men, leads on to fortune.

The person who reads our scribe's gifted public outpourings pictures the houses in his charge as being ventilated at the exact moment when the thermometer marks the prescribed degree, and shut down again when the mercury has descended to its allotted ebb. In practice what often happens is that, through absorption in the newly revealed delicacies of some fair Orchid, the glass reaches to 10 deg. above the supposedly safe maximum, and air, contrary to all teaching, is given in one huge rush. But does the dreaded scalding so much written of follow? Not it.

The half-hearted cultivator will spend an hour in digesting the instructions for sowing a packet of seeds, and another one in carrying the instructions into effect; meanwhile the "man who knows" will have sown a dozen packets, and perhaps be wondering why some of the seeds are not "up." So the two individuals will go on throughout the season, the one with a faithful adherence to (supposed) essential trifles, the other with a total disregard of them. And what is the result. Why, probably at the time of harvest the cultivator of the rough-

and-ready method possesses a crop of flowers or fruits upon whose countenances those of the "finnicker" dare not so much as cast their despondent eyes.

Much, very much more could be written upon this point, but enough has been said to show the timid voyager that he need not hesitate to embark upon the flowery ocean of his choice, even though he does not possess the wisdom of a Solomon, capacity for detail of a Ruskin, intuitive perceptibility of a South African war critic, or the wealth of a Carnegie to purchase the thousand and one "essentials" to success which the text book prescribes.

A word of apology is, perhaps, called for on behalf of those upon whom aspersions have seemingly been cast; so here it is. They prescribe what they know to be best, even though they do not follow out the prescription themselves.

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Annuals:

THEIR CULTIVATION AND THE BEST TO GROW.

This paper was read by Mr. J. Beggs at meeting of the S. A. Gardeners' Society.

Summer annuals, although not represented so largely as the spring flowering, yet give a greater amount of satisfaction on account of their continuing to bloom for such a long time, as by succession of sowings some may be had in flower for six months, and with less labor to the grower. In No. 1 paper I have dealt with mode of raising seed, and the various ways of planting them. It will not be necessary to repeat it here to any extent.

The watering of annuals is an important part, and the best way to do this is to irrigate the ground two or three times a week rather than light sprinklings every day, for the fault of many people is to wet the top of the soil only, and imagine they have given the plants a good watering, instead of which they hasten the death by bringing the roots to the surface, thereby parboiling them.

In the matter of what is the best time to water, opinions differ (most gardeners water in the evening), but mine is in the morning, as the ground is cooled down somewhat during the preceding night; anyway, the temperature of the ground and the water should, as near as possible, approach the same degree. The system of watering overhead is a very bad one, except to wash the dust off plants now and then, because the water does more harm to the flowers than the hot sun by settling amongst the petals, and when the sun shines fiercely on the particles of water it causes the flowers to decay much quicker than usual. This applies more to double than single flowers, the moisture not standing in these so long.

The great object in watering plants is that they should have abundance of water below their roots, and this can be accomplished by keeping the ground thoroughly worked; also by mulching with manure, which is becoming more general than formerly.

The propagation of annuals is nearly always carried on by sowing of seed. It can also be done by cuttings with many varieties; and this is an advantage when you wish to perpetuate a good strain. Phlox, Marigold, Calliopsis, Chrysanthemum, Salpiglossis, Centaurea, and many others, are suited to this way of propagation, placing the cuttings from side shoots in very sandy soil in pots or pans under glass in a shadehouse, and not kept too wet.

In the planting of annuals much scope is required to make an effective display. Our Botanic Garden is a most suitable place to show them off to the best advantage, more especially now that great improvements are going on in getting rid of the useless trees and opening up the Garden. Groups of Amaranthus, Asters, Zinnias, &c., about a garden give a deal of satisfaction, if well looked after.

Saving the seed requires a little trouble, and it should be gathered on a fine day, putting the seed-heads in cloth bags, naming them carefully, also the color of flower and its height, placing the bags in a dry room, where mice and insects do not get at them. These seeds can be left till some wet day, when they may be cleaned for future use. I do not hold with home-saved seeds of the best annuals being sown more than one or two years, as they are apt to run out, so it is better to get a fresh strain.

Many annuals when they have flowered can be cut back, which will induce them to break out at the joints and give another display of flowers.

Amaranthus (foliage plants)—These are one of our finest decorative plants, and should be grown by all. The cultivation is so simple that there is little fear of failure. I might say here, the richer the soil the less variegated they become. I think this applies to most plants having variegation. The ground then should be of a rather light nature of moderate quality to start the plants in. Water sparingly at first, so as to prevent the plants growing too tall; when the color is beginning to show, liquid manure is beneficial. Beds on lawns look well, using a ground-work of A. tricolor Henderi; next row of A. aurea speciosus; third row, A. melancholicus ruber; fourth row, A. splendens; fifth row or centre, A. salicifolius splendidissimus. Amateurs, when selecting, should be careful not to have such varieties as A. caudatus, A. cruentus, and A. monstrosus; these are mere weeds. Clumps amongst shrubberies are effective or dotted here and there along carriage drives, around fountains and ponds of water.

Asters—A class of annuals that are but seldom seen to perfection on the plains, and I should like to see them more extensively grown than they are. August is the month to start sowing seeds, and continued up to the end of October. I noticed in our public gardens last summer (November) a couple of beds which made a nice display, but rather irregular. I think the reason of their coming into bloom so early in the season was owing to the warm and dry winter preceding. Asters like a rich loam to grow in, with plenty of rotten manure added; double-shifted plants with a ball are the best; they may be planted six inches apart each way; being erect they do not cover much space. There are various ways of working the Aster, such as beds on lawns, lines, and large or small clumps in the borders. Mulching is very necessary, using plenty of water up till the flowers are well formed, when they can take less; and do not water overhead when in bloom on account of their double flowers, which retain the moisture, and cause the petals to decay at their base. Amongst the varieties for bedding purposes I give the place to A. Victoria (improved), followed by A. Dwarf, Chrysanthemum-flowered; then comes the Pæony, quilled and comet varieties. I believe some gardeners save their own seed, but I prefer to get it from a reliable seedsman; home saved seed varies too much, no matter how good the strain in the first instance.

Arnebia Cornuta.—A new and pretty annual, flowered by me once only, and think it requires very sandy soil, with plenty of sun.

Balsam.—As a border annual, or for pot culture, this makes a very suitable plant. It flowers from November to April, but is of no use for cutting. It requires as a rule a shady situation with abundance of water and manure in ground, and as a mulch, though I have had at times fine specimens growing out in the open border exposed to all-day sun, which were kept fairly dry, whilst those in moist borders have damped off. The finest plants are those raised from seed sown where it is to flower, and the best way of growing them is in clumps about the borders in sheltered positions. It is not advisable to grow them in beds, as they are so liable to damp off, leaving irregularities. In pot culture they like a light loam, and each shift can be potted deeper than the last. A seven-inch pot will carry a nice-sized plant, and a few might be tried where there is a greenhouse.

Browallia.—Fine for massing in borders, growing in the full sun. Ordinary garden soil.

Cacalia.—These require to be grown very thick in clumps and masses, very hardy, and do well in sandy soil.

Calliopsis.—This must be considered one of the best annuals which we possess, continuing in flower for several months, and if grown as I saw C. Drummondi in a hills garden last summer, it will give the greatest satisfaction. Circular beds on lawns, clumps, and lines in the borders will show them off to the best advantage. Recommended for spring flowering, also loam to light sandy soil, with full exposure.

Cosmos hybrida.—Cosmos bipannatus is a very old annual with small flowers, but its hybrids are far superior both as regards to size and colors, which make them one of our standard annuals. They are grand for cutting, having long stems and single dahlia-like flowers which last well in a cut state, and can be grown on the plains as well as our hills. There is one objection, which is their great height, to having them in small gardens; but this will be remedied in selection before long. Fair loam required, with mulch and plenty of water.

Celosia pyramidalis.—Having a good strain to start with, nothing can look prettier than the plume-like heads of flowers which these produce; they are indispensable to bouquet makers, as they are so graceful in their habit of flowers. It requires similar treatment to Celosia cristata, and the colors range from yellow to dark purple. The tall varieties are suitable for back clumps in the borders, and the dwarf can be used as bedding plants on a lawn. Most gardeners have very little idea as tc their worth.

Centaurea.—One of our best annuals, and very suitable for cutting. It thrives best in a sandy soil, but will do in heavy in the summer.

Celosia cristata (Cockscomb).—Although not useful for cutting, they are fine in the borders or in small beds, their colors varying from yellow to dark purple. If the colors are blended together, placing the tall varieties in centre of bed, they make a pretty effect. The seedlings require to be pricked off three or four inches apart in good light loam, and when about four inches high should be put out into the garden in the same class of loam.

Gomphrena (everlasting).—For making a display of bloom during our hot months nothing is more suitable than these dwarf everlastings, though they are not much used for decoration work except in a dried state. In beds the white, purple, and rose alternately, using the orange in centre, look well. G. aurea superba can be grown as a perennial by storing the roots in the winter time in some sandy soil just damp. This is worth knowing, as the seeds are very shy in germinating, and I consider it the best variety. Good to ordinary loam.

Helianthus.—Noticed in No. 1 paper. H. new miniature is perhaps the cream, as it will flower continuously three to four months, bearing dozens of flowers at a time, which are very light and elegant. This variety will stand cutting back if done lightly.

Helichrysum (everlasting).—Hardy biennials, but grown as annuals; suitable for the back borders. Stiff soil and plenty of moisture.

Leptosyne.—Though this is set down for an annual, it is a true perennial here, yet I cannot overlook the fact of its free-flowering qualities. It is also very useful for cut flowers, and can be propagated by cuttings. Any soil will do.

Lupinus.—A very useful border annual, and for cut flowers. Sandy loam.

Marigold (French).—Amongst the many annuals we grow this is one of the hardiest and best on account of its attractive colors and free flowering points. When a good strain is sown in a bed on a lawn they show up to great advantage. They are not generally used as cut flowers, as the odor is too pungent. Borders may be dotted with them or in other ways. Good loam and lighter for spring flowering, with plenty of moisture. If perfectly striped flowers are wanted, gravelly soil and less water is needed; or start them in poor soil, and allow them to show their colors, when they may be put out in the borders.

Marigold (African).—A stronger growing variety than the preceding, with larger flowers of self colors only. Useful for lines and clumps. They require stronger soil than the French. Some have finely quilled flowers. Sow seed in the open ground

Mina lobata (climber).—If a garden only contains a rod of ground a plant of this should be grown, as I consider it the finest introduction we have received for a long time. It is a very vigorous-growing plant, running up a tree quite 15 feet high in a season. If seeds are sown in August under glass, three in a three inch pot, and planted out as soon as they fill it with roots, will come into flower very soon after, providing the ground is not rich; but if this is the case, they will make foliage and no flowers till late in the season, when they make up with a display not easily to be forgotten, continuing till frost sets in.

Phlox Drummondi grandiflora.—If members will look at paper No. 1 they will note I have stated there is no equal to Phlox, either for spring or summer flowering. In addition to their striking colors, hardiness, and dwarf habit, they continue to look gay for months, and when grown in masses they are very striking. They delight in a fairly strong loam enriched with rotten cow manure; plenty of water at their roots only.

Portulaca.—Their dwarf habit, hardiness, and free-blooming points make them one of our best edging plants along drives and beds. They are not suitable for cut bloom, but what they lack in this is made up in brilliancy and number; especially is this the case when the weather is close and overcast. The seed should be sown where it is to flower, and in gravelly to sandy soil.

Salpiglossis.—Another annual which is worth a more extensive cultivation than it gets; and, although of a rather tall nature they make a grand show in the back of large borders, the colors ranging from yellow to dark-blue, beautifully veined, and resembling a Petunia, to which it is allied. As in most summer plants, they require plenty of water, and mulch of manure. The soil best suited to them is of a rich gravelly nature. Sow seeds in the open, or prick off into boxes till nice plants.

Thunbergia (climber).—One of the prettiest climbing annuals, which are of various colors. Plants may be grown on old stumps of trees with some wire attached wire baloons, and such like. The flowers are of no use to cut from. Sandy soil, in full sun.

Zea (maize).—A fine foliaged plant, and the variety Gracillima is suited to small borders, 8 to 12 feet through. Good light loam.

Zinnia elegans, fl. pl.—No garden should be without these, for they give a return not to be equalled by many other annuals. Most any soil suits them, and the same may be said of position. Two waterings per week is sufficient supposing the ground is well mulched. On lawns they can be used to great advantage, massing thickly, say nine inches apart. The seed is best sown where it is to flower. Zinnia robusta is a very large variety, but a trifle coarse.

I will now proceed to give list of varieties which may be considered the choicest of each particular sort; and I might say here the cheapest way to start growing annuals is to pay the price asked for superior strains, as one should not expect quality at the same price as rubbish; yet this is often the case.

FLOWERING AND FOLIAGE PLANTS.

For sowing in August, September and October.

Amaranthus tricolor splendens, 4 ft.; erect.
Splendidissimus, 4 ft.; erect.
Henderi, 3 ft.; erect.
salicifolious, 4 to 5 ft.; erect.
aurea speciosus, 4 ft.; erect.
Aster Victoria, 15 in.; erect.
Betteridge's quilled, 18 in.; erect.
Chrysanthemum-flowered dwarf, 1 ft.; erect.
Pæony-flowered, Truffant's, 18 in.; erect.
Comet, 18 in.; erect.
Arnebia cornuta, 2 ft.; erect.
Balsam Camellia-flowered, improved, 18 in.; compact
Rose-flowered, 18 in.; compact.
Carnation-striped, 18 in.; compact.
Browallia elata grandiflora, 18 in.; spreading.
Rouzli, 18 in; spreading
Cacalia aurea, 2 ft.; spreading.
coccinea, 18 in.; spreading.
Calliopsis Drummondi, 18 in.; spreading.
bicolor, 3 ft.; spreading.
marmorata, 3 ft.; spreading.
Celosia pyramidalis plumosa, 4 ft.; spreading.
plumosa rana, 2 ft.; compact.
cristata (Cockscomb), dwarf, 1 ft.; compact.
Carter's Empress, 2 ft.; compact.
Celosia cristata (Glasgow prize), 18 in.; erect.
President Thiers, 1 ft.; erect.
Cosmos hybrida (various), 5 ft.; branching.
Gomphrena (everlasting) alba, 18 in.; compact.
rosea, 18 in.; compact.
aurea superba, 18 in.; compact.
rubra nana, 1 ft.; compact.
Helianthus, Henry Wilde, 6 ft. erect.
globosus fistulosus, 6 ft. erect.
Primrose dame, 6 ft.; erect.
argyrophyllus, 7 ft.; branching.
new miniature, 4 ft.; branching.
Helichrysum monstrosum, fl. pl., 3 ft.; erect.
Leptosyne maritima, 2 ft'; spreading.
Lupinus Cruickshankii, 4 ft.; erect.
hybridus, 2 ft.; spreading.
subcarnosus, 1 ft.; spreading.
alba-coccineus, 3 ft.; branching.
President Cleveland, 4 ft.; branching.
Mensicoi, 18 in.; erect.
Marigold (French), dwarf, striped, 1 ft.; compact.
Scotch prize, 18 in.; spreading.
Marigold (African), Lemon Queen, 3 ft.; erect.
Orange Prince, 3 ft.; erect.
Mina lobata (climber), 10 to 15 ft.; climbing.
Phlox Drummondi grandiflora, 15 in.; compact.
Portulaca grandiflora, 6 in.; spreading.
fl. pl., 6 in.; spreading.
Salpiglossis variables grandiflora, 3 ft.; erect.
Thunbergia alata (climber), 5 ft.; climbing.
Zea (maize), Gracillima aurea, 3 ft.; erect.
Zinnia elegans, fl. pl., 3 ft.; compact.
robusta, fl. pl., 3 ft.; compact.
fl. pl., dwarf, 18 in.; compact.
Pomponicus, 18 in.; compact.
Tom Thumb, 1 ft.; compact

THE GLADIOLUS.

By L. H. Howell.

Culture.—Gladioli are of the simplest culture. Plant at any time from August to December, in any fairly good soil, well spaded. Set in rows three inches apart, or in masses six inches apart each way. Plant in full sun, if possible, and keep down weeds. They bloom from December to May. After Autumn, lift the bulbs, and after removing the tops let them dry for two or three weeks in any airy position under cover. Then, after removing the roots, store them in a cellar, or any cool dry place, away from frost, for planting again the following spring. Good rotten stable manure is the best, mixed well with the soil, so that it does not come in contact with the bulbs. In light soil the bulbs should be planted so as to give about three inches of soil over them. In very heavy soil they should only have about one inch of cover, and always see that you cover the bulbs with fine earth, so as to give them a chance to grow up straight, otherwise you will not get good flower stalks. Many people ask how long will a Gladioli, after planting, bloom. From long experience I find it depends a great deal on the weather and the part of the couutry in which you live. On the coast and up to about 1500 feet above the sea level the Lemoines will bloom from 10 to 12 weeks on the highlands, and frosty places from 12 to 14 weeks. The Childsi are about a week longer, and the Nanceianus next. The Gandevensis take from about 12 to 14 weeks in cold places, such as Mount Victoria. Some of those planted in the middle of August did not bloom until the middle of December. The soil is only a poor, sandy loam, and very little subsoil, so that in good soil they would grow and bloom quicker. There is one great advantage, the bulbs grown in poor soil always do well on being moved to richer and warmer growing districts. I find that bulbs grown in very rich soil are large and spongy, and are more liable to rot in rainy weather and wet soil. Bulbs taken up every season do much better than those left in the ground. Gladioli should be carefully attended to when the stalks are about six inches above ground. This is the time they should be kept moist, as they are then making most roots.

GLADIOLUS.

Roses.

◆

CULTIVATION OF THE ROSE.

By E. Smith.

The following paper, read before the South Australian Gardeners' Society, is well worth careful study:

The Rose has been elected from hundreds of thousands of beauties from all parts of the globe by universal consent the queen of flowers, and well she deserves the title. It has not only been appreciated at all times, but in all climes, and is found in every quarter of the globe—in deserts, in glaciers, on mountains, in marshes, forests, valleys, and on plains. That our climate is well adapted for the cultivation of the Rose may be seen by the splendid displays at our Shows. At a Show held here in October, 1869, the Duke of Edinburgh was present, and stated that he had never seen a finer display of flowers at any of the Rose Shows held in England. Well, to obtain good Roses you must cultivate them, and I will endeavor to give in as concise a form as possible my experience and practice. I will, therefore, begin with

Soil and Situation.

I know of no soil but what the Rose will grow in with the exception of drift sand and soil that contains salt or magnesia, but the best of all is a strong alluvial loam inclining to clay; it also grows well in heavy calcareous clays. Care, however, should be taken in such soils to drain when water is likely to lay on or near the surface. Still, any deep soil, with a cool subsoil, suits them well. A light surface soil, with limestone or sand beneath, will grow good Roses, with an abundance of manure on the surface, and dug in annually, but any ordinary garden soil will grow them to perfection if properly cared for.

In choosing a situation for a Rosery on a large scale, let it be well open, so that the plants may always have a free current of air. An open field is suitable for them, sheltered round with a hedge of some sort; and the Dog Rose, Boursault, and Sweet Briar are well adapted for such a purpose; so that you may have all Roses, or Roses to shelter Roses, on a small scale. They do well planted in double or single rows by the sides of walks, in open beds, or on lawns, &c. Some people plant their Roses under some tree or shrub, and wonder why they do not come to perfection. They will not stand such a situation, for the reason that they are robbed of their soil or food by the roots of the tree under which they are planted, and also by the want of a free current of air. I say give to the queen of flowers the best situation at command, and you will be rewarded by her beauty.

Propagation by Seed.—The hips of all varieties will be ripe in May or the beginning of June. They should then be gathered and kept entire in a flowerpot filled with dry sand, carefully guarded from mice. In August they should be broken to pieces by hand, and sown in beds, boxes, or seed-pans, the latter two not too shallow—say from 8 to 9 in. deep. Use a rich compost of rotten manure, loam, or peat, with plenty of sand, or an equal part of each of the above. Cover the seeds to the depth of about half an inch. If in a bed the same compost may be worked in near the surface. After sowing, let the beds or boxes be exposed to light and air, watering when necessary, and shading on very hot days. The seed will germinate and show themselves in September. When they have formed three or four leaves, exclusive of their seed leaves, they may be carefully raised, put into small pots, placed in a frame or pit, and shaded when necessary. If they are wanting to flower early they may be repotted in larger pots to grow them on, and in some cases they will flower the following season.

Our climate being so well adapted to the Rose's seed-bearing capability ought to produce some extra fine varieties if care is taken in hybridising. It requires some watchfulness to do this at the proper time; if too soon the petals will be injured in forcing them open; and in the hot weather in September and October, if delayed only an hour or two, the anthers will be found to have shed their pollen. In order to ascertain precisely when the pollen is in a fit state for transmission, a few of the anthers should be gently pressed with the finger and thumb. If the yellow dust adheres to them the operation may be performed. It requires close examination and some practice to know when the flower to be operated on is in a fit state to receive the pollen. As a rule the flowers ought to be in the same state of expansion, or, in other words, about the same age. A camel's hair brush is almost the best thing to take the pollen from one flower to another with, the hybridiser selecting the varieties he wishes to operate on. I wish some of our amateurs would take the work in hand, as I am sure they would be well repaid for their trouble.

Propagation of Roses.—There are four other methods of propagation applicable to Roses besides by seed, viz., by layers, cuttings, grafting, and budding.

Propagation by Layering is very useful with some varieties, such as Noisettes, Tea-scented, and other climbers, as some are difficult to strike from cuttings unless under very favorable circumstances. About the middle of November the shoots will be about 18 in. to 30 in. in length. From these the leaves should be cut off close to the shoot with a very sharp knife, beginning at the base to about two-thirds of the length of the shoot. The shoot must then be brought to the ground, so as to be able to judge in what place the hole must be madd to receive it. This may be made large enough to hold a small quantity of compost of rotten manure and sharp sand in equal quantities, well mixed. The shoot must then be tongued—that is, the knife introduced just below a bud, and brought upwards so as to cut about halfway through. This must be done at the back of the shoot, not by any means in the front or in the bend, so that the tongue does not close. To make certain of this a small piece of stick may be introduced to keep it open. Much nicety is required to have the tongue at the upper end of the shoot, so as not to be in the part which forms the bend or bow, as it is of consequence that it should be within 3 or 4 in. of the surface. The tongued part must be placed in the centre of the compost, and a moderate-sized stone placed on the surface of the ground to keep the layer in its place. They should be watered in the summer, and will be ready to dig up in the following June.

Propagation by Grafting.—There are many ways of grafting Roses. The most eligible is the common whip grafting; but I have not found grafting suitable for this climate. It is far too tedious as compared with budding, and does not produce such good results.

Propagation by Cuttings.—Cuttings should be planted in May and June. Suppose the cuttings to be from 8 to 10 in. long. All the leaves may be removed from the lower end—that is, the end which is to be put in the ground. Cut at just under the bud with a sharp knife square, or a little on the slant. Prepare a bed or border of good free soil. If at all inclined to clay, put some sharp sand at the bottom of the trench, which will materially assist them in making roots. Plant the cuttings two-thirds under the ground, and water them well during the hot season. Some varieties root much more freely than others, and on the plains failures are very frequent. The hills are more suitable, especially in some of the gullies, where water is near the surface.

Propagation by Budding.—This system I have found to be by far preferable to any other. Cuttings, even if successful, take at least two years to make fair plants; by budding a good plant may be obtained in four months, provided that the stocks are in a healthy state. The operation of budding is very easy to do, but difficult to describe. However, I will endeavor to describe it. A longitudinal cut, not so deep as to penetrate into the wood, but merely through the bark, should be made in the clear part of the shoots, thus |; then a transverse cut, thus —, at the top of the incision. It will then look thus T. The bark on both sides of the incision must be opened with the flat handle with which the budding knife is provided, and the bud inserted. Some recommend the thin piece of wood adhering to the bud to be left in. I always take it out. I have found from experience that the buds are not so liable to be blown off if the wood is taken out. To simplify this matter, take a rose shoot with its buds, cut off the leaves, leaving the footstalks about an inch in length, and then cut off a very thin slice of bark about an inch long, which should have a bud in the centre. This slice of bark will have a layer of thin wood inside, which should be carefully removed. The bud should then be inserted, commencing at the transverse cut, and thrust gently down. When the bud is inserted cut off with your knife a piece from the upper end of the plate—that is, the piece of bark with the bud attached—so that it fits closely to the transverse cut; then bind it up firmly, but leave the bud showing out, with cotton twist. Budding may be commenced in November and performed as late as the latter end of March. In about three weeks after budding the ligatures may be removed. All the branches not budded must be cut off from the stock cleanly about the time the ligatures are removed, and the budded shoots shortened to within two or three eyes of the inserted bud. This management of budding Roses is applicable to standards of all heights as well as dwarfs. Of stocks for budding on there are several kinds used—the Manetta, Sweet Briar, Banksia, Dog Rose, &c. I find the Dog Rose to be the very best for this climate, struck from cuttings from 1 to 4 ft. in length, and from $\frac{1}{2}$ to 1 in. in diameter, taking care to cut off all eyes at the bottom to prevent suckers, which are always a trouble.

Cultivation and Pruning.—All classes of Roses delight in soil well manured. They will stand a good dressing of well-prepared stable manure twice in the season, viz., one in the autumn—say in May—as a surface dressing. Let it remain on the surface until the latter end of August, when it should be forked in; bonedust may be used with it to advantage. Fork over the ground again about the middle of September, after which give your plants a good thick coat of mulching of moderately rough stable manure. This will keep the soil cool and damp, thus saving watering for some time. Stable manure, if thought to look unsightly, should be lightly covered with earth, just sufficient to cover the roughness of it.

MILDRED GRANT.

Pruning should be done at various times in the season, and the separate classes of Roses require different ways of pruning. There are winter and summer prunings. Hybrid Perpetuals.—The winter pruning should be done in June as a rule. Two-thirds of the preceding summer's growth may be cut off, taking care to give the plants an equal balance of shoots, so as to form a good head, whether it be standard, half-standard, or dwarf. In some varieties of Hybrid Perpetuals which make very long shoots, and others that are of a pendulous habit, nearly the whole of the shoot may be left. You will then have a fine racime of flowers the whole length of the shoot—not that you will get such large show flowers as by the former system, but the effect is grand. Summer pruning should be done as soon as the flowers drop. Cut down to one or two buds under the flowering heads; they will then make young wood, and flower again in a short time. All weak and useless wood should be cut out, to give the plant plenty of air. I am an advocate for disbudding, as being the best calculated to produce flowers of the finest possible condition; it keeps the plant in full health and vigor, and brings it to the highest state of beauty. It has been successfully applied in the cultivation of other trees, and why should it not answer equally as well with the Rose. The latter part of August or early in September is about the time to do it, or when the buds or young shoots are from one to two inches long. There are always too many shoots produced. To obtain fine foliage and flowers, in some cases half, in others two-thirds, of the buds may be removed, according to the variety and strength of the plant to be operated on. It takes but a short time to do, and when pruning time comes round there is very little work for the knife; if the roots are well adjusted, with few exceptions there is only to shorten them. Climbing Roses, such as Cloth of Gold, Gloire de Dijon, Boursaults, Banksias, and others of a similar character require a different mode of pruning to the Hybrid Perpetuals; and all summer Roses, whether they are trained to a wall trellis, or budded on tall standards so as to form a dome, which has a very fine effect, the dead, weak, and useless wood should be cut out, leaving the healthy strong wood as long as required. The pruning may be done at various times, but always after the main crop of flowers drop, unless the seed is required. Bourbons may be treated the same as Hybrid Perpetuals.

INSECTS AND DISEASES.—The Rose in all its stages is, if possible, more liable to the attacks of insects and various diseases than most of any other hardy shrub. There are many ornamental shrubs and trees which grow from year to year without any apparent disease, and increase in beauty as they increase in size. Not so with the Rose, unless it be some hardy climbing variety, for a choice kind of Rose left unpruned and uncared for only one season often becomes so weakly as scarce to be restored to vigor again. Foremost among its enemies is the Rose Aphis (Aphis rosæ), which seems to multiply itself almost magically. Some fine evening in September you may be admiring the vigorous, healthy shoots of your Rose trees, apparently clean and fresh and free from all blight; the next morning by 11 o'clock nearly every shoot may be found coated with its living world of insect life, some green, some brown or brownish, but all absorbed in one pursuit—sucking the life-juice from every shoot and leaf. No enemy to the Rose is so persevering or so injurious, for in twenty-four hours those fine luxuriant shoots crowned with their buds of promise will, if left uncared for, be withered and unsightly. The following is an effective remedy: Take four ounces of quassia chips and boil them ten minutes in a gallon of soft water, strain off the chips, and add four ounces of soft-soap, which should be dissolved in it as it cools—stirring it before using; the syringe may be employed especially for climbing Roses, for standard Roses, and Rose bushes. A shallow dish—such as a milk-dish—half-filled with the liquid, bending the shoots down as near as possible to the liquid, then with a soft painters' brush every leaf can be wetted in two or three minutes with but little waste. A man and boy will get over a large quantity in a day. Aften ten minutes or so have elapsed, the dead and dying insects should be washed off the tree with pure water from a syringe. The much-abused sparrow will attack the aphis and clean the Rose bushes in a few days, especially in the spring and summer months. In the summer months the curculio beetle or weevil, which hides itself in the ground, generally close to the stems, often commits great ravages by eating out the centre of each bud and the tips of shoots. He can only be caught at night, and from his dark brown coat and size, approaching that of a ladybird, a sharp eye and bright light must be employed.

In the months of September and October the rose caterpillar makes his appearance; he may soon be detected, for he glues a leaf or two together to form his habitation. As soon as such leaves are perceived—and every morning the trees should be examined—these glued leaves should be squeezed between finger and thumb so as to crush him effectually. Nothing but close attention will save your rosebuds from being perforated by him and ruined. No decoctions or infusions are of any use; the only remedy is the crushing one.

The worst disease known here is the white mildew, which often makes its appearance the latter end of summer. It is most difficult to arrest; it does not kill the Roses, but destroys the beauty of the leaves and weakens the tree. Flowers of sulphur sprinkled on the leaves and shoots in the evening when moist with the dew and washed off with the syringe the following morning will arrest it sometimes. If the weather be hot and the sulphur be suffered to remain on the leaves all the day following, mischief often occurs and the leaves burn. If the weather be cloudy it may remain on the leaves for twenty-four hours, but in all cases syringe the leaves and shoots abundantly with pure water to wash it off.

A few remarks as to the best classes of Roses to grow and I will draw this paper to a close, which I feel has done but scanty justice to so important a subject.

Roses of to-day and what they were thirty years ago there is a great contrast. The late Thomas Rivers published his first Catalogue of Roses in the year 1834, enumerating 478 varieties, and in the year 1869 eleven out of that number were only retained or cultivated, and none of them suitable for exhibition purposes, thus showing the wonderful strides that have taken place in their cultivation. There can be no doubt but that the Hybrid Perpetual is at the present day by far the best class, taking everything into consideration. They bear an abundance of flowers during the whole of the summer and autumn; their flowers are large, very double, most fragrant, and produced through the greater part of the year. Their habit is robust and vigorous in a remarkable degree; they are perfectly hardy and will grow in almost any soil and situation. In brilliancy of colors no other class can approach them.

At the same time some of the Teas, Noisettes, Bourbons, Mosses, and a few others should be in every collection, such as Belle Lyonaise, Cheshunt hybrid, Devoniensis, Gloire de Dijon, Madame Berrard, Md. Camille, Marechal Neil, Safrano, and Souvenir d' un Ami (as Teas), Aime Vibert, Cloth of Gold, Jaune Desprez, and Solfatere (as Noisettes), Baronne Gonella, Baronne Noirmint, Charles Souchet, Leveson Gower, Madame de Stella, Mrs. Bosanquet, Queen of the Bourbons, Reine Victoria, and Souvenir d' la Malmaison (as Bourbons), are about the best in their classes, which are all small as compared with the Hybrid Perpetual class.

NEW ROSES

Some confusion exists in regard to the new hybrid Tea Rose shown as Helen Gould at the recent Rose Show in New York. It is claimed by some to be the same as the Rose already known as Baldwin. However this may be, the Rose is exciting considerable attention and comment. It is said to be excellent for both out-of-door and greenhouse forcing.

All those who succeed with Golden Gate will want Ivory. It is an ideal forcing Rose, and will doubtless secure a place for itself alongside of the Bride, which is saying a great deal. It is very prolific and of good constitution, and the quantity of flowers produced will commend it. Its sparsity of foliage is held against it by some, but the same objection holds against Golden Gate.

ROSE FIAMMMETTA NABONNAND.

If only for its delicious fragrance this Rose should be grown. But, apart from such a valuable peculiarity, this variety is worth growing for its delicately tinted, globular blossoms. The color is satin-white, beautifully suffused and edged with rose, and its shell-like petals are very handsome. It cannot be called a very double Rose, but the petals fold over the centre so gracefully as to give the flower the appearance of being a very hard one. The growth is not quite so vigorous as one could wish, but perhaps it will improve in this respect. A newer variety named Baronne M. de Tornaco is said to be an improvement on Fiammetta Nabonnand. Certainly it appears to be rather more heavily marked with rose, and the white petals have a decided tinge of buff.

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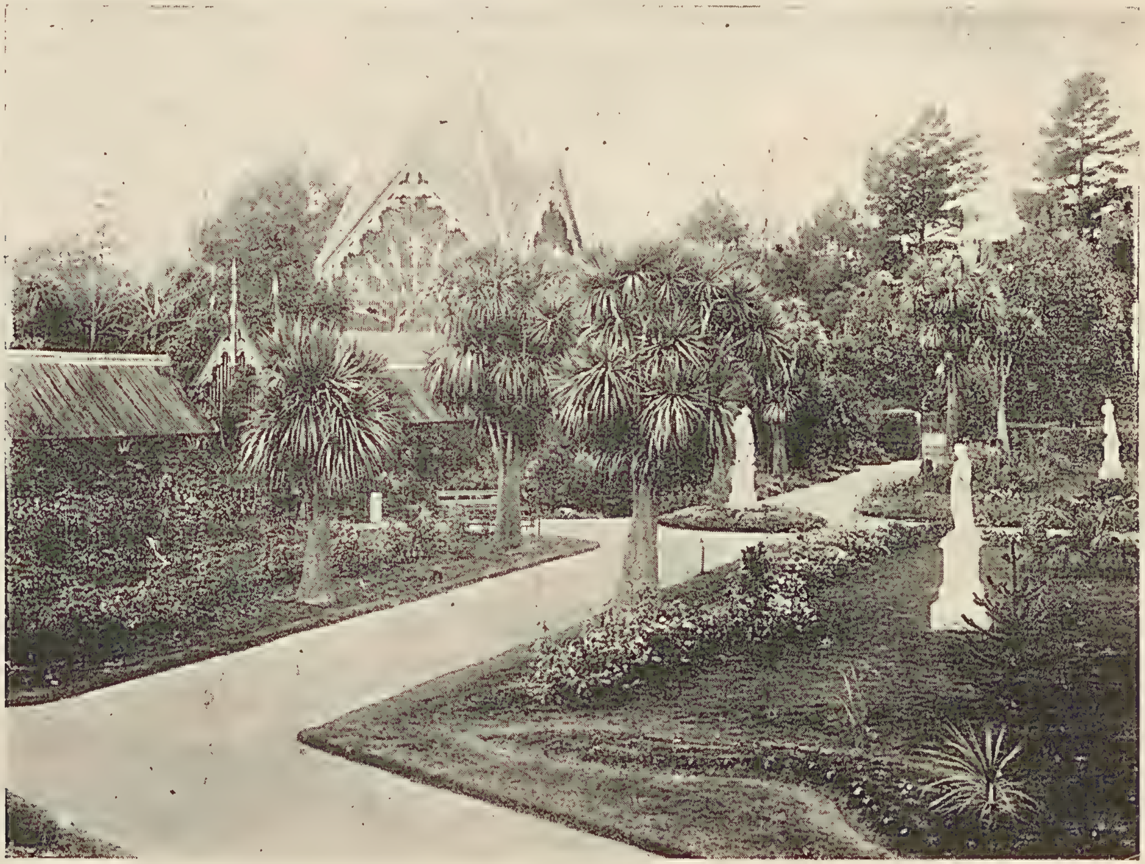
Iris Kæmpferi

(LÆVIGATA).

[From "The Garden."]

I never use peat in the cultivation of this lovely Iris. Even in its best form peat is not necessary, while the black, fibreless, and more or less solid kind is distinctly injurious. Equally undesirable and unsafe, so far as the plants are concerned, is it to plant such things in positions where the roots are constantly in the water winter and summer. A moist condition, or this and shade combined, very frequently suits this Iris to a nicety when saturation proves its ruin. To what extent this Iris likes constant saturation in Japan I know not; it is certainly the reverse of beneficial in the majority of instances in the British Isles. The frequent instances of failure when given this saturation are abundant proof of its unsuitableness in this country at least. Of the gross feeding nature of these plants and their special fondness for rich soils we have yet much to learn. With quite strong plants it is not readily overdone. I would much prefer to grow I. Kæmpferi in any ordinary soil, to be enriched as I considered right, than to trust to plants constantly supplied with moisture as the essential to success. What the plants really prefer is a condition where plenty of rich food is present for the roots, such as fat clayey mud and the annually decaying vegetable food that is sure to form in deep ditches and the like. Indeed, I. lævigata may frequently be planted in such places with entire success, while it fails as completely in what are apparently better positions. I once knew a disused gravel hole planted with these things. In this, old potting soil and refuse had accumulated to a depth of 2 feet. The success of these plants while they remained, during six years or more, was phenomenal. For many years these plants were a complete success with me in a soil that in hot summers became dust-dry to a considerable depth. In spite of this, however, I have yet to see so near London the plants that shall surpass them in vigor and free flowering. This success I attributed to the very liberal manner in which the soil was manured. The growth was fully 3 feet in height and even more the following year, while the masses of root fibres that extended in all directions I had never even dreamed of. It was from this circumstance that I began to realise that hitherto these plants had to some extent simply been starved by their surroundings. The root fibres had strength enough to penetrate anywhere, the pathways separating beds of the plants being quite filled with roots also. From this time I never omitted a heavy dressing of manure combined with deep trenching of the soil. Cow manure was that employed, and the cooling nature of it suited the plants exactly. In other respects the plants were fully exposed, more so than I would prefer had I the choice of positions.

Many who have ornamental water signally fail to grow these Irises because of planting at the edge of the lake or pond, and frequently in the worst of soil. Such things are much safer 10 feet away from the water and in a bed of the deepest and richest soil, and with water so near better



BALLARAT GARDENS.

This is a winter scene, looking east. The building visible in the photo. is portion of the extensive fernery. The height of the "phennial" is 50 ft., but the walls of the greater portion of the building are 9 ft. The City Council propose to pull the whole structure down, and erect a more substantial and ornamental building, with double the height of wall. The creepers when in bloom on the fernery building are a magnificent sight. They are Tecoma McKeni intermixed with Begonia grandiflora. The beds on the left are of Dahlias, Pansies, and variegated foliage plants. The borders in the distance are of mixed herbaceous plants. The one in the foreground is just newly planted, for late winter flowering. The Cordylinus Australis are the remaining specimens of what was once a fine group planted about thirty-five years ago.

generally raised above its level. Shade of a kind, not heavy or dense, is a matter of considerable importance for these Irises. Indeed, were I forming what I should regard an ideal spot, I would ask for nothing better than a half-shady place where a border may be made and where leaf soil and manure may be given at will. With these at command there is no reason why the group in question should not be more frequently a success as ordinary border plants, particularly where a so-called damp border exists. I am not saying there are no known instances of success when given the semi-aquatic treatment, but I would content myself did the extreme roots touch the moisture. Plants that may be perfectly happy beside a rippling rivulet may, rather I would say would, be almost sure to decline and presently vanish if planted in the sodden soil at the margin of a pond. In short, where Primula japonica will spread out its rosettes of leaves to 2 feet or 2½ feet across and send its giant whorls of crimson flowers as high into the air, there also will these Irises thrive.

E. Jenkins.

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Tuberous Begonias.

In the history of gardening during the past ten years or so no plant has played a more important part than the Begonia, whether as a bedding or a pot plant. Many specialists have been busy in improving the type of plant grown, and special attention has been given to the production of distinct types suitable severally for bedding, for pots, or for basket work.

When the much-desired upright habit of the plant is well shown in the shoot, and when we have such good growth carrying good flowers on stems thrown well above the foliage, there is nothing left in the way of improvement to desire. It must not be thought that flowers of such a type have been produced without very great attention being paid to selection of seed parents. Growers in a large way have to test many thousands of seedlings before making a selection of the best varieties for perpetuation.

THESE CULTURAL NOTES

are intended more particularly to deal with the treatment of tubers from the time they go to rest until they are again in active growth in their summer quarters; but they would not be in any way complete unless some allusion was made to the type of plant most suited to the various purposes for which it is grown. Single varieties, with self-colored flowers standing upright on strong stems, are the best for outdoor work, and these may be bought selected, true to color and type, without going to the trouble of getting named varieties, and they have, too, the vigor of youth, for they are generally sent out after having flowered once only. The double varieties may also be used for bedding, and are very effective though somewhat heavy looking. For baskets the drooping varieties are the best, and this class is the most poorly represented of all, having suffered in the struggle for those of an upright type. If some one would take them in hand and raise for us some good-colored forms similar to the primrose-colored double Alice Manning, one of the loveliest Begonias in existence, which has an ideal habit as a basket plant, there can be no doubt that they would be largely grown. For ordinary pot purposes a little licence may be given as regards habit, for many of the freest-flowered and finest varieties have a semi-drooping habit. In cultivating the plants it should not be forgotten that the tuberous Begonia of the present day is

A COMPARATIVELY SHORT-LIVED PLANT,

i.e., the same tubers do not live for very many years. A leading grower who was the first to popularise these plants told me several years ago that very few named varieties existed for more than half a dozen years, and if they lived longer they could never be grown to the same perfection after that time. It is necessary, therefore, to add now and then to the stock a few young tubers, and these may be readily raised from seed.

TO KEEP THE TUBERS THROUGHOUT THE WINTER

it is only necessary to have a dry, cool, but frostproof loft or shed, and to store them in it in good condition. Placing them anywhere under the influence of artificial heat is quite a mistake, as it causes them to shrivel and to break weakly in spring. Whether the plants have been grown in pots or in beds my winter treatment is always the same, and since adopting it I have never lost 1 per cent. of my stock. The plants are lifted from the ground or turned out of pots as soon as the top growth has fallen away from them. Most of the soil is then shaken from the fibrous roots and the tubers are put on a dry shelf for a few hours, or even, perhaps, for a day or two, until the soil still left on has become almost dry, when they will be fit for storing. I pack them tightly together in shallow boxes, one layer to a box, and put them on shelves in the loft or shed chosen for them. Here they remain all winter and until the young shoots formed early in the spring have grown to about half an inch long. This is the best stage at which to repot, or to prepare them for the beds.

TO INCREASE THE STOCK,

the largest tubers may be cut in two, three, or four pieces, according to size and number of shoots showing, each piece having at least one shoot left on it. Place the cut tubers on a shelf until the newly cut surfaces have become dry, and then dust them over with powdered charcoal or flowers of sulphur to prevent decay. Pot at once into the pots in which it is intended to flower the plants, for, though this entails much care in watering for a time, it is better than having to repot them later. Those for bedding are best put into boxes of sandy loam and leaf-mould in equal proportions, putting at the bottom of the boxes, in lieu of crocks, some flaky leaf-mould or semi-decayed horse-droppings. On this place the tubers, allowing them to stand at about 3 in. apart, and fill up between with the soil, a little of which should also be allowed to cover the tubers. Remove the boxes to a cold frame with an easterly aspect, protect from frost, and give air when required, increasing it as the weather gets warmer until the lights can be left off night as well as day. The night dews will benefit the plants and prepare them for their final move to the beds. It will be found that plants from boxes will grow away with much greater freedom than any that have been potted up, as they come out with their roots in a natural position, and ready to thread their way into the new soil.

IN PLANTING,

put the tubers 2 or 3 in. below the surface, as they enjoy coolness at the roots, and resent being baked by the sun. To assist in keeping them cool mulch the surface as soon as the plants are tall enough with some short manure or leaf-mould, and if the soil is naturally heavy and lumpy, a couple of handfuls of sand or road grit round each tuber when planting will be helpful. The only real danger of losing one's plants arises from over-watering the pots or boxes before the new roots become active, and this is the most dangerous period with them, as having no growth to support, the tubers cannot then assimilate water without decaying.

THE ONE GREAT ENEMY

to Begonias is thrips—not the ordinary black kind, but a little yellow beast, very active, and not easily seen. Watch carefully for any discoloration of the stems or leaves, and be sure that if you see brown markings on either the thrips are there. Fumigate weekly while the plants are in frames; this will destroy the insects without damaging the plants.

Cornubian, in "Amateur Gardening."

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ZONALE PELARGONIUMS.

It is not easy to prevent the cuttings, which are taken late, from damping off, and a warmed greenhouse will be necessary for them after the first month, when they do best in a sunny position in the open air, taking them indoors, however, during heavy rain. The cuttings, or slips, for these are the best for late purposes, should be allowed to dry for a day or two, lying on a sunny shelf or border before putting them into a well-drained box of sandy soil, where they should each be made very firm by pressing the soil round them with the thumb. If at all loose, they will be sure to die; it is, therefore, desirable to see to them occasionally, and press them in tightly.

THE EFFECT OF LIGHT ON PLANTS.

By James Matthew.

"Light is, except warmth," wrote Lindley, "the most powerful stimulus that can be employed to excite the vital actions of plants, and its energy is in proportion to its intensity."

Its chemical action is various. Under its influence there is a constant exhalation of oxygen from plants by day and an inhalation of carbolic acid. When darkness comes the action is reversed. The stronger the light the greater will be the outflow of oxygen, and the purer will, therefore, be the air for human use. Cæteris paribus, a sunny and dry land should be healthier and cheerier than a cloudy and rainy one. The nations of Southern Europe are at least brighter spirited than the Northern. The sunlight on constantly marshy land only draws up miasma.

It is light that sets going in the springtime young buds. At the point nearest to the light—the tips of branches—the leaf-buds first show. With increasing force of light growth advances; dulness or diffused light checks. With a strong, well-rooted plant, development is continuous; but when, as in the case of cuttings, there is no root formed, the strengthening light excites too great rapidity of growth, there is no forthcoming supply of sap in the stem to maintain the young leaves, and they are burned off. Hence the necessity for placing cuttings and young and tender plants in shade, viz., diffused light, and also for covering over temporarily newly transplanted trees or plants until they acquire foothold.

Perhaps the most obvious effect of light is to give color. Plants and children reared in cellars are of sickly hue. Plants grown in the dark are colorless. The first shoot sent up by a seed is almost without color, but as it creeps into the light its faint green tinge deepens. As a rule, roots are colorless, but there there are exceptions, as the carrot and beet. But let a potato or carrot peep above ground, and every portion exposed will speedily tinge green. The upper surface of leaves is darker than the under from looking upwards. The most intense and delicate tinting of petals is only possible in the brightest sunlight. It is in equatorial lands that the most gorgeous flowers are to be found. Sumatra is the home of the Rafflesia Arnoldi, the largest flower in the world. Towards the Poles tints shade off into dull greys.

Another result of exposure to light is flavor. As the sap rises in the stem it gets thickened by evaporation, the light also acts chemically upon it, and it is converted into organizable matter. It is from this that flower buds are formed, and from the flower buds fruit. In the fruit itself the action of light is direct. The flavor of fruits is caused mainly by the proportion of acid and sugar and essential oils. The noticeable taste of most fruits in the first stage is acidity. It is the sunlight that changes sourness into sweetness, and gives to each fruit its peculiar and essential flavor. According to the intensity of light will be the speed and thoroughness with which the change is effected. In diffused light fruit will not ripen well and all round. Fruit on low branches, or leaf covered, ripens often only on one side. Peaches are said not to be able to mature fruit in greenhouses where light is diffused. The best and most fruit in our gardens will be nearest to the light—at the tips of the branches.

1. Healthiness.—The intensity of its sunlight will cause free elimination of oxygen from foliage. No doubt the mallee leaves, with their rich, pure odorousness are being rapidly burned, but in place of them every year will see a variety and density of foliage round the settlement. The bright and dry air should be unfavorable too to some kinds of blight.

2. Activity of Plants.—Few things strike one more than the readiness with which cuttings root. No doubt the virgin soil has to do with this result. But without leaves you can have no roots, and it is the light that calls forth the leaves. The intensity of the light is, however, against the successful raising of annuals in the open.

3. Color.—The perfectness and softness of the tints of our flowers is a marvel. Gladioli, Verbenas, Roses, Pinks, Picotees cannot be surpassed. The blossom is rapid, endures only a very short time, and is gone. Flower culture for Melbourne sale may become an industry. Then there is the coloring of our fruits. The appearance of our apples, pears, oranges, lemons will affect their value. In our steady and bright sunlight our fruits should be finely and thoroughly tinted. Tomatoes ripen to a very perfect redness through and through. It will be a point, too, if we can with our advantages dry grapes and prunes with an attractive look.

4. Fineness of Flavor.—I regard this as of more importance than any of the preceding. It is taste, after all, more than show that guides the demand. If a fruit ripens under equal and steady conditions it is likely to be better than if exposed to uncertain and lengthened ones. With strong, equal, direct sunlight most of our fruits, with careful irrigation, should acquire a flavor all their own. With careful irrigation there should be avoided that surface burning of some kinds of fruits that destroys look and firmness and good taste.

Altogether the brightness and force of our sunlight, though it may imply careful rearing of young stuff—as cuttings and annuals—and involve possible misses in transplanting and budding, nevertheless will bring benefits outreaching far its possible drawbacks.—The "Mildura Cultivator."

BULBS AND COLD STORAGE.

A discovery of the 20th century is that almost all bulbs, be they Lilies, Irises, Hyacinths or Snowdrops, Tulips or Narcissi, are controllable by a certain range of the thermometer. The 19th century was responsible for forcing, but many bulbs were injured; others did not respond to it, or even perished of it. On the other-hand, frost killed bulbs, the term hardy being only comparative in this respect. The old method was to regard a bulb absolutely quiescent from the fading of the flower to the season for starting a fresh year of growth. But today the gardener learned that if on the completion of one year's flowering he places the bulb in a definite temperature, he can practically control the date of flowering in the next. Assume, for instance, that the ground temperature averages 50 degrees from August to March, and a given bulb flowers in July, by putting the bulb in a temperature averaging 40 degrees for the quiescent months it will flower in September instead of July without any dwarfing its growth. Of course, the matter is not quite so simple as in this brief note would appear. We only aim at giving the drift of what may be called the "cold storage of bulbs."—"Graphic."

TABLE DECORATING.

All plants employed for table decoration should have pieces of some close-growing greenery, such as Selaginella Kraussiana in its various forms, dibbled in the surface of the soil wherein they are growing. If this is done when the young seedling or rooted cutting is put into its pot, by the time it is fit to take its place on the table the Selaginella will have grown into a beautiful green, yellow, or silver carpeting for it. Many people place this green covering over the soil only when using the plants, but it has not then so graceful or natural an appearance as when established and growing.

A person who has much table decoration to carry out will do well to always keep a few pans of Selaginella growing ready for emergencies. Shallow pans, such as are supplied with orchid pots, are the ones to use, and they should contain but the thinnest layer of leafy, sandy soil, so that it and the greenery can be transferred with little disturbance to pots wherein their services are required.

Sphagnum Moss, and many of the varieties in the woodland, make useful substitutes for Selaginella, but are scarcely so well suited for growing on the surface soil of the pots, as many of them form tufts not sufficiently pervious to air.

Fodder Crops.

MAIZE COMPARED WITH THE MILLETS.

[From the "Journal of Agriculture," Victoria.]

In addition to the proved suitability of Southern Victoria for the cultivation of the sorghum family, the experiments last year gave pronounced evidence of the splendid success that might be obtained from another class of plants—the millets, frequently grouped with the sorghums. Only two varieties—the Japanese and pearl millet—were obtainable on the Melbourne market at the time the experiments were undertaken, but the two, I think, have proved sufficient to pave the way for the introduction of a crop which will be taken up as a favorite throughout the whole of Gippsland and the Western District. Quick in growth, fine in foliage, and of great adaptability to a wide range of soils, even the poorest with manure, the Japanese millet especially will, I feel sure, rapidly catch on among dairymen. The pearl millet, while giving heavier yields, is much slower in growth, and a little more particular as regards its soil, but on the rich flats, with a sufficiency of moisture, yields of 30 tons and perhaps more to the acre might be procurable from the first cut. From the second cut very large yields ought also to follow. The Japanese millet in a favorable season, and got in early, would certainly give two and probably three cuts. Of the two varieties I should recommend it as the most generally suitable for Gippsland. A comparison of the yields of the millets with maize and amber cane will show the position the crops hold in productive power to these two crops.

Maize Compared with Japanese Millet.

	Based on the average yield of all the manured sections.		Based on the average of the maximum yields.	
	Maize.	Japan's Millet.	Maize.	Japan's Millet.
	Tons.	Tons.	Tons.	Tons.
Average of 9 fields ...	8·95	9·53	10·59	11·48

Amber Cane Compared with Japanese Millet.

	Amber Cane.	Japanese Millet.	Amber Cane.	Japanese Millet.
	Tons.	Tons.	Tons.	Tons.
Average of 9 Fields...	9·50	8·79	11·74	10·43

Maize Compared with Pearl Millet.

	Maize	Pearl Millet.	Maize	Pearl Millet.
	Tons.	Tons.	Tons.	Tons.
Average of 6 Fields...	12·07	12·73	14·60	14·72

Amber Cane Compared with Pearl Millet.

	Amber Cane.	Pearl Millet.	Amber Cane.	Pearl Millet.
	Tons.	Tons.	Tons.	Tons.
Average of 6 Fields ..	13·72	12·73	15·90	14·72

Amber Cane Compared with Teosinte.

	Amber Cane.	Teosinte.	Amber Cane.	Teosinte.
	Tons.	Tons.	Tons.	Tons.
Average of 4 Fields...	13·79	16·78	15·10	19·77

It will be noticed that the amber cane has in both cases given heavier yields than either of the millets, while the maize appears to have been slightly exceeded in the yields by both. This, I think, on the better class of soils would not, as far as maize and Japanese millet are concerned, be a general thing. A number of these returns were secured from light soils of no great natural fertility, and on such soils, with manures, the Japanese millet particularly has done better than the maize. As a general thing heavier yields will, I think, be obtained from maize than from Japanese millet as a first cut. On rich, moist flats the pearl millet may exceed the maize, but is slow of growth and late in maturing. An objection raised by one farmer is that the cows do not take readily to it. Fed on amber cane and maize, doubtless some little time would be required to acquire a taste for a different fodder, but I hardly think the objection will be found a general one. The Japanese millet, apart from its heavy yield, is exceedingly quick of growth, appears to be relished by all kinds of stock, is fine in the stalk, makes good hay, and put in early ought to give two, perhaps three, cuts during the season. It should be cut just as the seed heads are appearing.

Japanese Millet (showing Second Growth), Upper Tambo.

The Returns from Teosinte.

It will be noticed that the tables show the returns from another crop—teosinte, a crop very similar in appearance and character to the sorghums. It has the reputation, under favorable conditions, of producing the largest bulk of fodder of all forage plants. The yields it will be seen, taking the average of the four fields, are a good deal in excess of the amber cane. It is, however, very slow of growth, requires plenty of moisture, and is about fit for cutting just before the first frosts. Its only use, I think, would be for silage. It will not, I think, catch on generally as a forage.

THE OPINIONS OF DAIRYMEN ON THE VARIOUS CROPS.

The point which up to now has received special prominence in this paper has been the bulk of fodder obtainable from each crop. Considerations of the palatability of each forage plant, its nutritive value, suitability for different periods of the season or different localities have not been dealt with. For answers to these questions we are dependent principally upon the verdict of the dairyman. The opinions of the dairymen vary somewhat with regard to certain crops, but there appears a great unanimity with respect to others. A few of these opinions have already been given. Extracts from a number of letters from the more prominent growers are given here. It is not to be understood that I agree in all respects with the opinions expressed by these growers.

Japanese Millet.

Mr. Grant, Upper Tambo:—"My opinion of maize as a green fodder is soon stated. I would not grow it again because Japanese millet planted on the same day, cultivated under the same conditions and cut the same day, gave a greater weight in the first cut, and was afterwards cut twice. With maize the cows did not increase as much in milk as with the Japanese millet."

Mr. Crowe, Eltham:—"The Japanese millet I like very well, and will certainly put in some of it next season. The cows eat it well and also milk well when fed on it."

Mr. McGrath, Loch:—"The other forage crops, after beet, I would class as follows—First, Japanese millet which, if sown early, in my opinion, has no equal as a summer feed for dairy cows, as it could be fed off twice and then let go for seed and hay as it will do for both."

Amber Cane.

A few opinions have already been given in the early part of this paper on amber cane. In addition to these, Mr. Grant writes:—"In respect to the feeding qualities of the various fodders, I must say I believe very much in amber cane, I find that my cows are very fond of it, and that they milked well while being fed on it, giving an increase of butter. I think that it is better than maize, as it stands the hot and dry weather, while the maize withers."

Mr. McGrath:—"Amber cane I would class as equal to maize for autumn feed, although my cows milk better on it than they do on maize, and, unlike some others, I have never had any trouble with it in feeding to the cows, as I never feed it until the seed is well out."

Mr. Grant:—"This plot has done very well and gave a good weight of green fodder. It was cut on the 4th March, and has since made a growth of fully 3 feet to 7th May, and as it has tillered out there is again a good weight of fodder."

Mr. Gooding, Moe:—"With respect to the forage crops I will place them in this way—1st amber cane, 2nd Egyptian corn, 3rd Kaffir corn, 4th teosinte, 5th maize, 6th pearl millet. You see I have placed the maize fifth because you only get one crop, and a great amount of labor in cutting the maize, as we feed off the others and get two and sometimes three crops off them."

Pearl Millet, Upper Tambo.

Japanese Millet, Bairnsdale.

Steele Bros., Rosebrook:—"With regard to feeding qualities, now that we have fed all the crops, we consider the amber cane comes first of all the fodder plots, as it would weigh much heavier than the others, and the stock seem to eat it with more of a relish. One advantage with the amber cane is that it will stand much longer than the maize without drying off, and, of course, that is a great advantage."

Planters' Friend.

Mr. Henderson, Bairnsdale, places this crop first. Mr. Crowe, of Eltham, reports the Planters' Friend did very little good here. Mr. Grant, of Upper Tambo, writes:—"This is a crop I intend to grow next year. It is still green and succulent, May 1st, and all stock are fond of it. It has given good results in all ways; I have used it for horse feed, or cut it into chaff for calves that are hand reared. When fed to cows it gave a good increase of milk." Mr. McGrath, of Loch, writes:—"My second choice after Japanese millet is imphee or Planters' Friend which for later feed is undoubtedly better than maize as the frost does not affect it nearly as much as maize."

Teosinte (2 Rows), Moe.

Teosinte.

Most of the growers as yet are a little shy in expressing opinions on this crop, owing, I think, to its very slow growth. On very many farms it has undoubtedly proved a failure. On others, however, exceedingly heavy yields have been obtained. The following are some of the opinions received:—Mr. Grant, who had one of the most complete and carefully tended fields of the lot, writes:—"This crop ranks very high indeed in my estimation. The seed was sown on the 16th October. When the hot weather came, in the middle of January, the teosinte grew very quickly, and continued to do so in spite of the fact that the official record of the rainfall during January, February, and March for this district was the lowest for many years. It will grow during hot dry weather, which is a great consideration. When the stems are more than an inch thick they are so tender and succulent that young calves about two months old eat it readily. One trouble a dairyman has in many parts of Victoria is that about the time his hand-fed calves are fit to wean, the grass, although plentiful, is so dry that weaned calves will not thrive until the autumn rains come. Teosinte will remedy that, for I have proved they will do well on it."

Mr. McGrath, at the time of writing, had not commenced feeding this crop. He writes:—"There is one of your fodders that I have not as yet had experience with, viz., teosinte. It is now (May 7th) growing very rapidly, and is just coming out into flower. It is now over 6 feet high. I intend giving it another trial by sowing it earlier next season."

Mr. Miller, of Upper Maffra, writes:—"The stock eat it readily, but, judging by this trial, it would hardly give a large enough quantity, and is also very coarse."

Mr. Gooding, of Moe, writes:—"In regard to the teosinte I believe it to be the best of the lot in a dry climate, where it could be sown about the end of August, as it would give a great quantity of green feed, and the cows are more fond of it than any of the other crops. I cannot quite understand it, it shows no sign of going to seed. It is now about 9 feet high, and looks beautiful. If it could come as quick as the other crops I would place it first."

Kaffir Corn, Egyptian Corn, and Pearl Millet.

Varying opinions are expressed by the dairymen with regard to Kaffir corn, Egyptian corn, and pearl millet. The opinions generally entertained are that they are inferior to the crops just dealt with. The second crop, however, appears to be better in the case of the Kaffir corn than in amber cane. Mr. McGrath is of the opinion that neither Kaffir corn nor Egyptian corn it suitable for his district. Mr. Grant reports that the Egyptian corn did not do well in his district. The Kaffir corn, however, he intends to grow in preference to amber cane owing to its larger second growth, and as he thinks better feeding qualities. Mr. Crowe thinks the butter was not so sweet when the cows were fed on Kaffir corn and Egyptian corn as with amber cane, but reports that the cows showed a liking for the crops. The pearl millet in Mr. Grant's opinion is a very good fodder, well liked by cattle and yielding a good weight per acre, but in his estimation it falls behind the Japanese variety both in yield and quickness of growth.

Cow Peas, Soy Beans, and Florida Beans.

The field of Mr. Grant was the only one in which these three crops were included. His report is, therefore, of exceptional value. I give his opinions on each crop:—"The cow pea plot grew well all through the hot dry weather and kept beautifully green until the occurrence of a very slight frost, which turned the tops black. A few blossoms only appeared but no peas formed. The cattle did not like the peas at first and some cows would not eat them even when chaffed and mixed with Planters' Friend. Some of the cows afterwards acquired a taste for them. I would like to try an earlier kind next season. The horses ate them very well."

"The soy bean is a crop I hope to give a good trial next year, as I have saved enough seed to plant a good area. I think the reason of a lot of the seed not germinating this season was that the ground was too wet and cold when sown; but what did grow gave great yields of beans for the size of the plant."

"The Florida beans did not grow well until the hot weather, when they grew rapidly. Some plants had a few flowers on but no beans. There were not enough of the plants to judge of their feeding value."

Vegetable Garden.

OPERATIONS FOR AUGUST.

Artichokes, Globe.—May be planted out now in those districts where the rainfall has been good, and other conditions are favorable, but there need be no hurry about the work until the early spring. Either young plants or suckers may be planted. This vegetable needs good soil to enable it to produce the artichokes, which are, in point of fact, the flower buds, which are gathered just as they are about to open.

Artichoke, Jerusalem.—This is a sort of sunflower bearing tuberous roots, and is not related in any way to the above. The tubers should be quite ready for use now that the plant stems have died down. The soil is the best storehouse for them in the place where they were growing, for they are liable to rot away soon if kept above ground. This is a tender plant and easily cut down by pests. Plantings may be made in spring.

Beans, Broad.—Early-planted beans should be making good progress when they have sufficient moisture in the soil. The month of June is a good time in which to make extensive sowings, if necessary. A row or two every week should suffice to keep a supply going. The seeds are generally extremely dry, and may need soaking before planting, and after sowing the drills should be thoroughly well watered.

Cabbage.—Plant out from time to time during the month, and sow a little seed occasionally in order to keep up a supply of plants. Be not sparing of manure if you wish to grow good cabbages, for this vegetable is a gross feeder, and should be well treated.

Endive.—Sow a little seed occasionally in the warm parts of the State.

Carrot.—There are many varieties of carrot, from extremely small to large. The small kinds are the best to sow during the month. Whilst young the carrot is a tender and rather weak little plant, and is easily choked by weeds if they are not kept in check. Advancing plants should be thinned out gradually.

Leek.—Sow a little seed, just a pinch or two, during the month from time to time, in a seed-bed. Plant out any leeks that are large enough to move to a bed made rich with abundance of manure. Plant the leeks in shallow trenches, give them abundance of water during their growth, and when nearly fully grown earth up the stems.

Lettuce.—Sow a pinch or two of seed occasionally during the month. Transplant from a seed-bed of a previous sowing any young lettuces that have sufficiently matured, and be cautious not to break their roots more than can be avoided. Use plenty of well-rotted manure, and try to grow the lettuces crisp and tender.

Onions.—A little seed may be sown occasionally if it be considered that sufficient ground has not already been laid down to onions. Plants may be transferred from seed-beds to the garden if the weather be suitable. If seed be sown during the month, some fine young plants should be ready for planting out in the spring.

Parsnip.—Sow a little seed from time to time during the month in drills. The parsnip is a deep-rooting plant, therefore it is desirable to prepare the ground well and dig deep preparatory to sowing.

Peas.—Sow occasionally a row or two, to keep up a succession. Every effort should be made to keep a constant supply of this most useful vegetable for as long a time as possible.

Radish.—When used young and tender, the radish makes a most useful change. There are many varieties, some of which are very pretty when nicely cleaned and arranged as a salad. Prepare the ground well, and use plenty of well-rotted rich manure. Sow but a few seeds at a time, say once or twice a week, in drills.

Herbs.—These may be planted out whenever required. A vegetable garden should never be without a good collection and some little trouble should be taken to keep the plants in decent order. Very often they are neglected, and have not a fair chance to grow properly.

SIR DAN DE LION.

Sir Dan De Lion rode forth one day,
With the Hore-hound at his heels,
His mettlesome Colt's-foot pawed the turf,
And the Blue-bells rang glad peals.

And many a lady fair rode to
Her Sorrel that beautiful day;
There was Pimper-Nel and little Prim-Rose,
And Violet, Whin, and May.

A Man-Drake told them the Mountain-Thyme,
So they ate Bread-and-Cheese on the spot;
And Creeping Jenny came up and cried,
"I pray you, Forget-me-not?"

They saw the Bull-rush down to the lake,
And they saw the Cow-slip up;
And they sat on Toad-stools and drank bright mead
From a golden Butter-cup.

They heard the Crocus, and donned their Furze
In the bosky Aspho-del;
And they all rode home to their flower-beds,
As the ghostly Night-shade fell.

—"Chicago Tribune."

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The Flower Garden.

OPERATIONS FOR SEPTEMBER.

Every day during this month brings additional evidence of the growing strength of the sun, the most striking feature being the bursting buds of spring. How fascinating, and how marvellous, is the new mantle of spring! Note the skeleton branches of the fruit trees and the ornamental deciduous shrubs and trees. From this apparent deadness of branches there comes the swelling of life, with all its power and potentiality of beauty. Who can say how? The scientist and the botanist can give us disquisitions upon the process of development from root to flower and seed, and back again, season after season. But the life, the power, the thing that apparently dies, and now forces itself into a beautiful resurrection with the first genial rays of sunshine in spring—that is the mystery that makes the learned man take a step back and bare his head to the great unknowable. The poets sing of it with the birds in music more or less intelligible, the artist's pigments are plied with beautiful skill to paint the springtide of time, and the gardener conjures with Dame Nature to beautify his surroundings, and, lo! what a happy and lovely world we live in—so interesting, so instructive, so mystifying, and so charming. Look at yonder orchard, with its deadwood trees, and a closer examination will reveal a potent power which has been hoarded up all the winter, showing now in little hard knobs at the tips of the twigs. Here and there a small brilliant streak of red, unfolding itself slowly into rosy blossoms, whose bosom is carrying a luscious fruit.

Now is the time to assist Nature in her birth of the new year's fruitage and flowering. Dig about the ground and enrich it. Plant out all the delicate little seedlings that have been prepared for the beds. Do not treat them as though they were so many sticks, to be shoved anyhow into the ground. They are tender little things, and will repay care, producing good shapely plants and smiling flowers. Many people who love gardens, and who put a lot of good honest work into them do not seem to realise sufficiently the fact that gardening requires a constant exercise of intelligence upon what appear to be minor matters. The evidence of this is clearly demonstrated in a garden where intelligence is exercised, and in one where details are of no consequence. Plants should be carefully laid out, but the best of plans are useless if the details are not attended to, and now is the time to do it. For instance, nothing is more serviceable when laying out beds than 4 x 1 in. jarrah, but if it is set in the ground without due regard to straightness or gracefulness in curving, as the plan requires, the effect is abominable. The same remark applies also to tiling, which looks very neat if properly laid, but very ugly if it is put down carelessly.

WEEDS.

Weeds are just now at their best. They are doing very well and strong with the past favorable season, and they will upset all the best calculations upon flower gardens if they are not turned upside down or rooted out. Soursobs (oxalis) are making a lovely display of brilliant golden yellow in some gardens and fields. They are the despair of some gardeners, and we have been plied with many questioners upon how to get rid of them. We can only repeat our advice to turn them up constantly. It is the only way. Constant exposure of the roots and bulblets to the sun will eventually kill them off. What is true of soursobs is equally true of all other weeds, and to prevent them from growing old the best way is to kill them off while they are young.

A WELL LAID-OUT GARDEN.

The following description of a well laid out garden contains most of the information that a gardener will look for to guide him in his operations this month. The garden is too large for the average cottager, but the beds can be formed in number and size to suit the ground to be operated upon. It is written by M. Hawthorne for the "Gardener," and will bear careful study.

A well laid out garden is undoubtedly what the poet called "a thing of beauty" and a "joy for ever." In summer it is glorious with color and sweet with perfume, of course, but even in the depths of winter its formation is attractive.

Such a well laid out garden is the one that I shall now describe. It is an elaborate combination of lawns, and quite an unusual number of flower beds. The chief walk is very wide; from its sides rise thin iron pillars, painted white to match the stone walls that divide the principal lawns from the broad path which, in its turn, is flanked by scalloped borders, in one of which grow the climbing Roses that adorn the house. These thin iron pillars are connected by chains that droop gracefully, and are garlanded with many Clematises. The two paths farther on are ornamented at their ends by similar chains, pillars, and Clematises.

The chief walk conducts the visitor to a rockery of circular form, in which rare Alpines flourish, the rocky wall forming the outside to a marble basin and fountain.

Around the principal lawns are diamond shaped beds; each small one contains a Standard Rose tree, with different carpeting plants in each, representing all the excellent varieties of Pinks, Alpine Phloxes, Myosotis, Silenes, Violas, and others too numerous to mention. The two longer beds (with diamond pointed ends) are spanned by wire hoops, upon which Clematises are trained. The larger diamond beds are reserved for bedding out effects of the best possible description; Hyacinths are succeeded by Ivy-leaved Geraniums and Begonias, and tiny evergreen shrubs keep the places between the Hyacinth bulbs pretty all winter, the Crocus, Snowdrop, and yellow Aconite borderings beginning early to be gay.

Ten beds are never without their Pansies, of giant sorts, the best named Fancies; when a plant fails in summer it is cunningly replaced by a younger one, so that the succession of blossom is maintained. Beds in the lawn's rounded corners are filled with dwarf Tea Roses, as are also the large beds down the side walks, the intervening diamonds being Tulip beds in spring, and yielding displays of Fuchsias, Heliotropes, Verbenas, Geraniums, Lilies, and Carnations in summer. Each, during winter, has one or more ornamental evergreen shrubs for centrepieces.

The stone walls are made so that they have five stone baskets as summits along each; from these baskets are Ivy-leaved Geraniums, Lobelias, Fuchsias, and many lovely flowers hang down, a small kind of Palm being the centre of each. The borders beneath are also well cared for, being under the house windows. Wallflowers and Myosotis, Anemones fulgens, pulsatilla, blanda, and Hepatica, Daffodils, Narcissi, Tulips, and Crocuses are to be seen here before Cannas, Nicotianas, Calceolarias, and Begonias. The borders nearest the house are terminated at the steps by larger stone baskets or pedestals.

Continuing the chief walk we come to two scroll shaped borders, which are closely planted with Hybrid Perpetual, Tea, H. Tea, Moss, Polyantha, and Fairy Roses, Teas pegged down covering the earth most satisfactorily. This same Rose massing is carried out in the large bed in the furthest centre lawn; the four round beds have Standard Rose trees only, above Violas, the Roses being pink, the Violas golden, while the lesser rounds, with scalloped edges, hold three Standard yellow Roses each, above purple Violas.

In the side lawns are five beds of Carnations, with four diamonds of Pinks. A bed in which early flowering Chrysanthemums are alternated with Phloxes and Madonna Lilies, with a bordering of Violettas; a bed on each side lawn for dwarf Gaillardias; four beds on each serve to show how lovely are the tints of Tom Thumb Nasturtiums, after Crocuses are over.

There are two white painted iron seats in front of the Herbaceous border, this being chiefly representative of Delphiniums, Tritonias, and Starworts in great variety, Michaelmas Daisies being, of course, included. The waved border, on the right-hand side, is wide enough to show flowering shrubs as well as perennial plants. The border on the opposite side of the garden has more flowering shrubs, surrounded by biennials—Canterbury Bells, Scabiouses, and Sweet Williams. All the beds in gravel are box edged, and so are the borders.

Behind the borders on the two sides rise white painted, 6-ft. trellises, over which Roses, Clematises, and other climbers ramble; at the end of the garden is a 6-ft. wall, against which some fan trained fruit trees prove that they can beautify the flower garden.

ANNUALS.

In a paper upon "Annuals," Mr. A. McDonald gives some interesting information. Annuals are generally understood to be plants that grow up, yield their seed, and perish the same season in which they are sown. The term annual, though popular, is not by any means correct as applied to plants. Applied to many things it is simple and clear, but when you apply it to plants you get out of a clear atmosphere into a thick fog. It is quite possible to get two or three crops of what are called annuals in one year, and on the other hand individuals of these same sorts of plants may live under slightly altered conditions any number of years. Plants are living things having no fixed period of life whatever only what the conditions bring about. What is an annual in one place is a perennial in another place, or even in the same place under altered conditions. Take, for example, the well-known plant the Mignonette. In all the catalogues—Colonial, English, French, and German—the plant is put down as a hardy annual. Now, you may get two or three crops of it in one year; and on the other hand English—and I should say Continental gardeners as well—grow plants of it into nice bushes, and some of them live over several years by keeping them under artificial conditions. In North Africa, where the plant is, I believe, native, it grows into woody shrubs. The more you try to get a clear idea of what an annual plant really is the more foggy the whole thing becomes. It is the conditions which seem to determine the issue, and no hard and fast line can be drawn between annuals and perennials.

Mankind cultivates plants because they are useful to him, and in the front rank for usefulness, far ahead of all the other cultivated plants, stand the few annuals which form the chief food of man; and it is remarkable that out of the immense number of plants in the vegetable kingdom there should be so few found capable of taking even a secondary place against the old ones handed down to us from remote times. Our present high civilization, great in many things, perhaps, cannot boast of introducing into any good food plant like wheat or rice. It is highly probable, I think, that the first plants that ever were cultivated by primitive man were annuals, as their cultivation is of the easiest and simplest kind. To sow seed, and reap a crop in a few months, does not require a very large amount of intelligence, although it is evident it could only be done by man, there is no evidence that the apes do anything of the kind, as far as I know. But if our civilization has not introduced into cultivation any good new food plant, it cannot be said that it has failed in introducing numbers cultivated for pleasure. In our times it has grown up to be almost a necessity that people should have flowers in their gardens, and even in their houses, and to supply these wants there has been at least a good try; and in this line I don't think that annuals take the place they do in the food-producing plants, what are called perennials seem to assert their claim to consideration. Although there have been a very great many introductions, there is not such a very great number of what are really well known popular flowers, which mostly everybody knows, and everybody wants to see in their season. Amongst these are a lot of perennials which flower the first season; and it has become the almost universal practice to grow these as annuals. Where that is practicable, it is the most satisfactory for various reasons. Seedling plants generally grow away freer and better than offsets or cuttings. Seedlings give a better chance of improvement or variation in any particular direction. While young they do not take up much room, as a good number can be raised up to a certain size in a small place, and when done flowering they can be put away out of the way at once, as all that is wanted is a bit of seed to begin again. I refer at present to plants cultivated a good deal in pots—Chinese Primulas, Cinerarias, Calceolarias, Mimulus—these seem to keep their place against all comers. They are popular mostly everywhere, and they do remarkably well in our climates, especially Primulas and Cinerarias. Chinese Primulas are specially nice for winter flowering pot plants, and I think if a little more attention was given to saving our own seed and sowing of it a little earlier than is generally done, an advance might be made with this flower. There is a general impression about that seed of this and other things should be imported. I think this is a mistake. It does not improve seed to come 11,000 miles across the ocean, and through the hot tropics. And our country is a good seed-producing country; better, in fact, than where it comes from, only they go to more trouble in looking after it than we do. Selecting the plants and saving the seed are matters of the first importance. The same remarks apply to Cinerarias. Our own saved seed generally comes freer and grows better than imported. The Cineraria is in the old country a great favorite as a pot plant for the spring decoration of conservatories and greenhouses. Here, in addition to these qualities, it is well adapted for planting out of doors in beds and borders. Care is required in raising and getting the young plants on through the hot weather, but when that is over they should not be too much coddled. Plants for putting out might be raised in beds of good soil planted out 1 ft. apart, and where they could be protected from frost, and in the spring of the year they are wanted to bloom. Calceolarias are rather more difficult to do with us, as they are later in flowering than the Cinerarias, and the petals of the flower are thin and do not stand our hot drying winds. I have sometimes seen some very fair plants at some of our shows, but a house of herbaceous Calceolarias like I have seen in the old country, the Adelaide people have not seen yet to my knowledge. Some of the best of the growers save their own seed, and no doubt improvement in culture will follow. Mimulas are easier done than any of the above. They are suitable for pots and bedding. We have Gloxinias grown from seed and flowered the same year. There has been a wonderful advance in this flower. The flowers have got to be large, bold, and attractive. The plant does not like the very hot weather, but through the mild weather in summer and on in to the autumn they do well. Tuberous Begonias if well attended to may be bloomed the same year from seed. They may be had in flower a long time, but I think they are best in the autumn. Few flowers are more popular than the Pansy among English people. Strictly speaking it is a perennial plant, and it likes a cool climate, but with us it is best treated as an annual. The seed may be sown about February in pans or boxes, the young plants pricked off when large enough in to a bed of good soil in a sheltered place, where they can be attended to for water, &c., and when the rains come they can be planted out where they are wanted to bloom. Perhaps as an annual there are few things to beat for general usefulness Phlox Drummondii. It suits our climate remarkably well, and may be had in bloom the greater part of the year. It seems strange to me that so much seed of this fine annual should have to be imported, as colonial seed is really so very much better; there is, in fact, no comparison. Stocks are well known to all English people that take any interest in flowers. I have an impression that they are considered common; if they were to be rechristened with a more classical name perhaps they would be more admired than they are, for they are massive, beautiful, and deliciously scented when well grown. They should be sown if possible where they are wanted to bloom, but if that is not practicable they may be sown in beds of very sandy soil in March or the beginning of April, protecting them from heavy rains or too much wet in any way. When strong enough they can be planted out where they are to bloom. A very pretty class of annuals are the everlastings, especially the Acroclinium and Rhodanthe, our climate suits them well, and mostly any one will be pleased with them. Then there are the Balsams and Coxcombs. They are getting more attention, and as they do well in the open borders if they have good rich soil and plenty of water, they are well worth a little trouble. The China Asters were reckoned the very cream of autumn flowering annuals, and I suppose they are still; florists have improved them very much. Our summer is too hot and dry for them on the plains, in the hills they do better. I have not had much experience with them, but I think they may be had on the plains at times when they are better understood. Then there are Zinnias, Marigolds, and Gomphrenas (Globe amaranths), which do well and do not require any particular care, but of course do better where they are well cared for; but the magnitude of the subject of annuals quite appalls me. I cannot do better than draw attention to the illustrated catalogues of the seedsmen; they are full of information, and as it is all got up as a matter of competition in business, it is as well done as it is possible to be. Even the seed packets, a good many of them at least, are covered with information; the danger is, I think, that this sort of thing will be overdone; it belongs to the cramming system of the age; there is no lack of information from many sources, only in cultivating annuals or any other sorts of plants, it is not what you know, or what you think, it is what you do that is going to have any effect. To achieve success hard work is necessary, and the best sort of knowledge as an aid to that is that gained by observation and experience. If a person has the cultivation of any particular plant at heart, he will cultivate it well if he has never read one word about it. On the other hand, he may be crammed with information and yet do nothing. I think it would be an advance if people were encouraged to think for themselves and act on their own honest opinions. More satisfaction, I think, would be gained by thinking and acting independently.

SUBSCRIBE TO . .

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Answers to Correspondents.

"Queen."—The names of the best Chrysanthemums are legion. Apply to any seedsman, who will be only too happy to supply you with a catalogue.

"Buffalo."—Yes; this is about the best time to set out a lawn. Trench the ground well, and with a liberal supply of manure work the soil up well. The roots may be layered along in drills, but the better plan is to set the roots in holes a few inches apart. One of the best grasses for lawns is the old English meadow grass Poa pratensis, which is very hardy, and does well in dry places.

"Carnation."—We cannot give a list of the latest introductions of Carnations from England. The latest we have met with is known as the Lawson, introduced from America. It is spoken of very highly in the last English mail files.

"Cottage."—This is the best time to dig up and divide Chrysanthemums. It is best to have one strong main shoot on a single root to begin with.

"Sweet Pea."—No; we should say that Sweet Peas are more popular in America than in England. The States have magnificent shows devoted entirely to them. No standard classification has been made.

"Poison."—The specimen sent is the poisonous weed known locally as the cocoanut weed, the Cape weed, Cape Tulip, and Cape onion. The botanical name is Homeria Collina, or Maraea Collina. The generic names are synonymous.

"Amateur."—Grow them from slips.

"Show."—Table decorating is an art that must be learnt by practice. Any number of designs can be obtained, but success lies within the power of those most highly gifted.

"Rosebeds."—Cowyard manure is the best, although a little bonedust is helpful once in two or three years. Nothing is easier than overfeeding with liquid manure.

"Pests."—The best plan we have seen adopted for slugs and snails is to liberally place patches of salt upon the footpaths. It seems to attract the night marauders, and kills them.

"Trellis."—We like to recommend the Passiflora (passion flower) and Clematis for trellises as a variety. But for a permanent trellis nothing compares with the climbing Roses.

"Subscriber," Quorn.—Our best advice is to order Foster Mellier's "Book of the Rose," from a bookseller. You will get all the information required in the best form; but we thank you for the query, and will deal with the subject as space permits. The abbreviations in Mr. Sewell's catalogue you will find explained in the heading to each division. See page 111 for instance.

Daffodils.

Many lovers of the pretty and graceful Daffodils of spring are disappointed this season that the Show that was held last year in Adelaide did not give sufficient encouragement to repeat the effort this season. A big Show certainly entails a deal of time and trouble, but it would have been some couragement to repeat the effort season. A satisfaction if the enthusiasts had combined and held a Show on a small scale. It was not at all necessary to engage the Town Hall. A small room in the city could have been obtained, and without going to a lot of trouble, the staging of a few tables, gracefully set out, would have been a sight that many lovers of flowers would have been glad to see. The expense could be made of a nominal character, and as to the prize list, it might have been cut down to a few classes. Ten or a dozen for champion blooms and collections would have served the purpose, if, indeed, prizes are needed at all. We would much prefer to see exhibitors entering their blooms for love, with a neatly printed certificate of merit to give an impetus to the element of competition.

That Daffodils are popular flowers in Australia is abundantly proved by the fact that scarcely a garden exists anywhere without them in some form. This popularity has grown wonderfully, too, within the last few years. It is only a very short while since the better strains of this lovely flower were introduced, and where the common garden variety of Jonquil was the only representative of the family year in and year out, we now find the latest introductions and novelties. True, we lack many enthusiasts to spend money in fancy priced introductions, or to attempt anything in the science of cross-fertilization for new strains, but there are nevertheless a number of growers whose collections do them infinite credit, and quite enough to make an exceedingly good show. We sincerely hope that not another season will be allowed to pass without some effort to make a Show, if even only on a moderate scale.

Our illustrations give a general idea of Daffodils that are easily grown and exceedingly ornamental. An exhaustive article upon their classification and culture appeared in the "Australian Gardener" in last September number, and we now quote from the "Gardener" a selection of beauties that can be obtained for next season.

Selection of Tazetta.—From a garden aspect the Tazetta section—or, as it is almost invariably termed, the Polyanthus section—owes its popularity to Dutch raised varieties, whose value lies in their adaptability to pot culture. The following are, however, thoroughly worthy of inclusion: Hermione citrina, Hermione Mediterranea, Intermedius major, Intermedius Sunset.

Dutch Varieties.—Bathurst, Bazelman Major, Double Roman, Gloriosa, Grand

Group of Daffodils.

Narcissus Tazetta.

Monarque, Her Majesty, Jaune Supreme, Maestro, Paper White and its varieties, Queen of the Netherlands, Soleil d'Or, States General, White Pearl. The most useful of these for forcing are Paper White in two or three varieties, and Double Roman, all pure white and extremely floriferous.

Leedsii—Maggie May.

[From Peter Barr's Catalogue.]

Interesting Small-cupped Daffodils.—In addition to those to which attention has been called, there are several species that are extremely interesting, though they may not possess high merit as florist's flowers. Biflorus, the Primrose Peerless Daffodil, is well known, and much admired, as also are Jonquilla and its double form, both of which are delightfully fragrant. The Jonquils are more useful for pot culture than for outdoors, where, if planted, they must have a warm position, in which they can receive winter protection. Schizanthes orientalis is bunch flowered, and grows 14 in. in height; while the rare little Serotinus carries its flowers on slender stems in autumn.

Rare and Expensive Daffodils.—Except in occasional instances, the rarer varieties have been excluded from the foregoing going selections, as the stock being very limited makes them exceedingly expensive to procure. Many of these have been raised by the Rev. G. H. Engleheart, Mr. J. W. Barr, the Rev. Eugene Bourne, and Mr. Backhouse; while a few have come to us from Holland. To those who aspire to the dignity of being amongst the foremost specialists in Daffodil-land some of the novelties are essential, but it must be understood that the purse should have long strings if half a dozen or a dozen are wanted.

There can be no question as to the magnificence of such as Peter Barr, Weardale Perfection, Monarch, Big Ben, Lord Roberts, Duke of Bedford, King Alfred; or of the striking beauty of Albatross, Border Maid, Cassandra, Una, Egret, Lucifer, Maggie May, Sceptre, Seagull, and White Queen, but one bulb of each of the seventeen enumerated would involve an expenditure of upwards of 150 guineas at the prices quoted in Barr's catalogue. The superb white Ajax Peter Barr heads the list with 50 guineas, which must surely be a record for a single Daffodil bulb, in this or any other country.

Abundant and Cheap Daffodils.—Just as there are Daffodils whose cost is so great as to allow of their culture only by the favored few, so are there Daffodils which are so cheap that they come within the scope of any one having a garden. But strictly speaking, it is not for the home garden, often of severely limited extent, that low priced varieties are required, because in this case the restricted numbers necessary do not involve a great outlay, except under special circumstances. It is those who wish to furnish areas of grass in lawns, wild gardens, woodland walks, and grassy meadows, demanding thousands of bulbs, that look for those which will make the best display for the lowest initial cost. Some excellent varieties are: Barii conspicuous, Johnstoni Queen of Spain, Pallidus praecox, Horsefieldii, Poeticus, Poeticus ornatus, Obvallaris, Sir Watkin, Burbigei, Henry Irving, Odorous, Princeps, Telamonius plenus, John Bain, Emperor, Palmerston, Abscissus, Stella, W. P. Milner.

Daffodils for Rock Gardens.—Broadly speaking, any Daffodil that flourishes in the border will thrive in the rock garden, but the wise worker invariably cuts his coat according to his cloth, and rather selects his varieties according to his rockwork. In rock gardens of considerable extent, such as are found in a few places, situations can be found for representatives of the several sections of the Narcissus family, but in small rockeries only those that make low growth, and will, therefore, be in harmony with their neighbors, ought to be chosen. It will frequently be found that varieties which make little or no progress in the general border will flourish amazingly in the rockery, for the simple reason that here a special soil may be provided if desirable, and a position can be chosen that insures partial shelter from the sun. Again, in rockeries the perfection of drainage is readily ensured, and protective material can be applied in winter if necessary. Some of the best for rockwork are: Cyclamineus, Cyclamineus major, Juncifolius, the Sweet Scent Jonquil, Minor, Minimus, Nanus, Bulbocodium (Hoop Petticoat) in variety, Triandrus albus (Angel's Tears), Macleaii, Moschatus.

Daffodils for Pots.—One occasionally hears it said that the varieties of Daffodils required for pot culture must be chosen with the greatest care, but as a matter of fact any sort one likes to put in pots and treat properly will grow and flower satisfactorily. Where failure accrues, the cause can almost invariably be traced to an error of management at some stage or the other, though, of course, the bulbs will now and again fail from no apparent cause. It is where forcing tactics are to be adopted that care is requisite in selection, judging the capabilities of the varieties by the simple expedient suggested in an earlier paragraph. Having these facts in view, the enumeration of varieties for culture in pots would merely be a waste of space.

Carnations.

THE PINK.

By R. Dean, in "The Gardener."

A desire was expressed a short time ago by one of your readers that I would write some account of the Pink. As it is the season of this fragrant flower, a few remarks as to its history, characteristics, and culture may be acceptable to the readers of "The Gardener."

That the normal form of the Pink (Dianthus plumarius) was that of a single blossom, with some colored markings about the throat, and having a fringed margin, I have no doubt whatever. One may, in the present day, gather seeds from a fine, double variety, sow them, and find among the progeny several single forms. Their appearance means that Nature oftentimes harks back to normal forms, just to remind us of the origin of the double flower, and also to let us see she is not quite a passive actor in the floral drama.

The common name Pink means an eye in the Dutch language, from which it is supposed to be derived. Given, therefore, a common single Pink, with a fringed edge, and we have to consider the probable way along which the flower has travelled in the course of many years until it reached the large, double, finely laced and fragrant, smooth edged flower of the florist of the present day. Truly a great and important transformation.

It is thought that the first attempts to cultivate the Pink as a florist's flower commenced about the year 1620—in the troublous reigns of Charles the First. We know from early records that improvements took place, and that a tendency to doubleness began to manifest itself. We may, therefore, assume that towards the close of the seventeenth and on through the eighteenth centuries the efforts of improvers had been so successful that by the year 1800 there had been developed a double flower with a colored centre and white fringed petals, rich in perfume, and pleasant to the eye.

Another epoch in the development of the flower then commenced, and efforts were put forth to get the bloom fully double, to produce some color in the petal edges, and to secure petals with smooth and not serrated margins. I do not for a moment imagine that the florists of 1799 had set up in their minds an ideal flower, because they lacked experience; but I think that Nature helped them towards an ideal by developing in a rudimentary form characteristics which suggested to the florist the line along which the flower might be led in the way of development.

The rudiments of an ideal flower were obtained when, towards the end of the eighteenth century, a florist named Major, who, it is said, lived in the South of England, raised from seed a Pink he named Lady Stoverdale, and it is recorded that this was the first Pink "possessed of that singular and beautiful ornament called 'lacing' which is a continuation of the color of the eye round the white and broad part of the petal." The promptings of Nature led the florist to seize upon this peculiarity and develop it, and that with considerable success. A catalogue in my possession, dating back to 1817, states that of the garden or cultivated Pink "there are sixty double varieties in cultivation."

Up to 1880 the Pink was much grown for exhibition purposes, and during the forties and fifties many Pink shows were held about the country, the flower being very popular. What is desirable is a renewed interest in the cultivation of the Pink, and it is only by keeping the flower before the public that this renewal can be encouraged.

The Pink is not difficult to cultivate; and in order to have the fine laced varieties in the best character the plants should be in the open air. Presuming that good plants from pipings or layers can be had, it is excellent practice to plant them in a bed by themselves. The soil should be prepared some two months previously by selecting a piece of good garden ground, digging it deeply, and working into the soil some well decomposed manure, the Pink being a somewhat gross feeder. The foundation being laid in this way a layer of some 4 in. of refuse soil of a sandy character should be placed on the surface, and be gently forked over two or three times so as to incorporate it with the soil below. This addition should raise the bed, which may be 5 ft., or more or less, in width, and of any length some 4 in. or so above the level of the ground, which is a matter of some importance in winter, as it admits of stagnant moisture being drained from the roots during the time of heavy rains.

Planting may be done at any time in September or October, the earlier the better, so that the plants can become well established before winter sets in. This work should be done on a fine day, the plants being placed 18 in. apart each way. Three plants could thus be placed across a bed 5 ft. in width, or four could be managed on one 6 ft. in width. The advantage of beds of about these widths is that the plants can be reached from the side paths when it is necessary to inspect them. It is well at the time of planting to see that the plants have good balls of roots, and also to have on hand some fine sandy compost, in order to induce them to start into activity as soon as possible. As winter approaches and rough weather may be expected, it is a wise plan to peg down any lengthy side shoots to prevent them being tossed about by winds.

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CARNATIONS WHOLESALE

The following list gives an idea of how the Americans grow Carnations for sale. Mr. Taylor is only one of a large number of growers, and the tally of his lot runs considerably over 100,000.

E. J. Taylor, Southport, Conn., has planted in white: Queen Louise, 5,000; Flora Hill, 3,000; May Naylor, 1,000. In light pink: Daybreak, 4,000; Maud Dean, 4,000; Genevieve Lord, 20,000. Dark pink: William Scott, 15,000; Mrs. Frances Joost, 15,000; Mrs. T. W. Lawson, 500; Cressbrook, 1,000. In red: G. H. Crane, 2,000. Crimson: General Gomez, 2,000; General Maceo, 5,000; Governor Roosevelt, 4,000. Yellow variegated: Eldorado, 5,000; Golden Beauty, 500. White variegated: Mrs. G. M. Bradt, 5,000; Prosperity, 5,000.—Florists' Exchange.

SOIL FOR CARNATIONS.

Opinions differ on this question, and there is no reason known to me why they should not. What is the requisite for a good carnation soil? I have seen them well done in almost pure clay, and have seen equally as good Carnations obtained in a sandy loam. Taking all things into consideration, I prefer a medium heavy loam, with some vegetable fibre in it, and with manure enough to make it sufficiently rich to support the plant until feeding on the benches is commenced. Some three years ago we laid up a compost of sod and only a small quantity of manure, the sod coming from a piece of very light upland. We also lay up annually a compost of heavy soil, composed of sod from an old pasture, with considerable clay in it, and cow manure, using these in the proportion of seven parts of soil to five parts of manure. This is our Rose soil; and for Carnations we use this and the light compost in about equal parts after they are thoroughly mixed and pulverised; and on planting we add a small proportion of sand to this mixture. The result is a medium heavy soil, and yet one which contains sufficient vegetable fibre; the sand has the tendency to make it friable and easy to work. I do not believe that it is necessary to have a heavy soil, but if the soil will hold moisture without becoming waterlogged and therefore sour, much less care and attention to watering will be necessary.

With horse manure we have had a great deal of experience, and are now fully convinced that, at least for Rose growing, it is decidedly inferior to cow manure. We have found, also, that with Carnations we have better results where no horse manure is used. I know that the horse manure is cheaper, and that many employ it, but for Carnation culture I should not hesitate to recommend the use of cow manure in preference, as I believe it will give a great deal more satisfaction to the grower.

The practice of green manuring is becoming more and more popular, and the farmer can here teach the florist some very important lessons. Take, for example, a certain tract of land which will ultimately be used for soil, and anything which will add to the fertility of this piece of land will in the end become of benefit to the plants for which the soil is used. "By green manures is meant any crop that is grown primarily for the purpose of improving the soil, and not for the harvested crop." I take the liberty of quoting from Voorhees, who is an authority on this subject: "It is essential that the soil contain mineral elements, phosphoric acid, potash, and lime, but a crop of a nitrogen gathering plant will add to land enough nitrogen to support several crops of wheat. By ploughing under a crop of a leguminous plant, such as red clover, cow peas, or soja beans, vegetable fibre is also added to the soil, which is of value, especially if the land has been cultivated for some years, and therefore deficient in this. For field culture this is especially valuable, and if green manuring were better understood it would be more widely practised. The presence of nitrifying bacteria in the soil is essential, but they are usually present in fields which have been under cultivation, and the presence of these bacteria can be recognised by the nodules which are formed on the roots of these leguminous plants. Keeping these points in mind; the securing of suitable soil is comparatively easy."—W. R. PIERSON, Florists' Exchange.

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MALMAISON CARNATIONS.

Probably no flower, with the exception of the Rose, finds greater favour with the cultured classes of England at the present day than the beautiful Malmaison Carnation. When the controversy was raging in Coronation year as to which was really the Queen's favourite flower, Her Majesty so frequently appeared at public functions wearing Malmaison Carnations that had the controversialists not been blinded by their prejudice for another of Flora's gems, they must at least have recognised the claims of this noble Carnation. It is still fashion's favourite, and one had only to note the enthusiasm aroused in the Upper Ten by the magnificent exhibits of this Carnation at the Temple Show to feel that its position as such is very secure.

* * *

Sweet Peas.

Like every other plant growing in our gardens, Sweet Peas have suffered considerably in this most untoward of seasons. Fortunately, however, for the happiness of their ever-increasing army of devotees they possess remarkable powers of recuperation, and a few sunny hours work wonders with the plants, bringing up buds where none could be seen seven or eight days before. In my anxiety to bear testimony to the iniquity of the weather I had well nigh forgotten to attach any blame to the voracious slug, who has certainly had far more than a fair share of the Sweet Peas this season. Let us hope that the advent of July will bring with it warm days and growing nights, when we shall soon forget that trouble ever existed.

It is at this period of the plant's life that one usually commences a little special feeding, and it will be wise to exercise more than ordinary care in doing it this year. The chances of the growths being sappy are very great indeed, and plants in this condition are invariably more difficult to feed than those which have a strong, thrifty nature. The danger lies, of course, in overfeeding, this tending to the production of growth that is still more succulent.

Nitrogenous manures should be studiously avoided, reliance being placed on foods of a phosphatic and, in a lesser degree, of a potassic character. Two or three days prior to a show it will be permissible to give a very light application of nitrate of soda, as this imparts color as well as size to the flowers. Those persons, and there are many such, who are shy of using this, may find almost equal benefit from soot, but this is slower in its action, and must be applied earlier—say, seven days in advance of the date at which the flowers are desired to be at their best.

An important point in the growing of Sweet Peas for exhibition lies in the reduction of the sprays on a plant. Assuming that the utmost care has been taken of the clumps from the time they were first formed, in the way of allowing abundance of room for every shoot to come away untrammelled by its neighbors, and that the small sticks which are advisable immediately the planting is done have been supplemented by thoroughly efficient stakes, there will certainly be more flowers set than the plant can possibly bring to perfection. Some buds must, therefore, be removed, so as to afford every chance to those which are retained.

To numerous persons this may sound to be a considerable sacrifice, and for the moment it does entail a loss in garden effect, but it is only for such a short time, and our show blooms are so much finer for the thinning that no one should hesitate to carry it out. Once the all-auspicious day is passed, and the coveted prize is won (or lost), the plants may be allowed, nay encouraged, to flower away merrily, as they undoubtedly will do if they are properly looked after. To cease to trouble about the plants when the show is past is a sin, as they are yet full of vigor, and still give scores of excellent sprays.

Sweet Peas have no equal amongst the dozens of annuals that are regularly grown in English gardens for persistence of blooming, provided they receive the attention to which they are indubitably entitled. The principal thing is to pick the flowers as closely as possible, so as to prevent even the semblance of the formation of seed pods. If the grower once allows the plant to turn its energies towards the direction of seed development he will quickly see the effect upon it. In its anxiety to do one thing well it will let the one thing be that which will go towards its perpetuation—seed production—rather than to the bringing forth of more flowers. In good ground, watered and fed as may be necessary, Sweet Peas seem to have the power of practically perpetual blooming, and this is a trait that all lovers of the fragrant flower should encourage.

H. J. WRIGHT, in "The Gardener."

TO CLASSIFY THE SWEET PEA.

Colour versus Form versus Nothing.

"What has the Sweet Pea done that it should be subjected to all the horrors of classification?" is a question that many a lover of this charming flower will growl out as soon as the subject of classifying it is mooted. The answer must be, I fear, that we want to classify everything nowadays, we like to make the simple complex, the straight path crooked, and then to sit down and glory in the beautiful tangle of rules and obstructions that our ingenuity has called into being.

The florist is a wonderful fellow. There is no simple flower that he cannot hedge about and classify—to this end was he born, and we have only to accept the situation. When Mr. W. P. Wright suggested at the Sweet Pea Conference two years ago that classification by color was the method he favored, the listening florist rubbed his hands and smiled a guileless smile. He smelt complexities ahead. That color scheme is simple now: it will not be so simple presently. We are content for the most part with selfs now, with a few half-hearted bicolors. By-and-bye there will be fancies and shows and Picotee-edged flowers, a galaxy of stripes, and spots, and bars, and then nobody will quite understand the arrangement, and the florist will be happy.

The alternative scheme of classification by "form," especially of the standard, has been discussed not a few times. I fancy that it was the Rev. Mr. Hutchings who first suggested that here was a natural grouping offered for those who chose to take advantage of it.

The so-called "hooded" form is perhaps the most highly evolved type of all, but, sad to say, it is closely related to a type where the standard is erect, and the margins are not curled over at all. This is the Sweet Pea of the damp, growing season, and the up-to-date cultivator who believes in "thin seeding" and good soil.

The notched standard is sufficiently noticeable, and it would be easy to separate novelties where standards were notched in this way from others in which the standard was entire. So far it all seems quite easy. We have but to cry "notch or no notch," as we used to cry in those far-back schooldays, when the choice of innings at a Saturday's cricket match was in progress, the while a pocket-knife with a chipped handle was flung skywards. But, stay, the quality monger comes in and declares that the notch is a defect, and that he will not grow varieties thus marked. He finds many people to agree with him, too, and it may well be that the Sweet Pea of the notched standard is on the high road to extinction. Then there will be only one group left, and classification by the form of the standard will have gone by the board. Perhaps it will then be color or nothing. I fancy that I shall not want supporters when I say that I hope it will be nothing.

—"The Gardener." CRYPTOS.

Roses.

MILDRED GRANT.

Messrs. A. Dickson & Sons, who, of late years, have taken the premier position as the introducers of new Roses of superior merit, have eclipsed all their previous efforts in the production of the Hybrid Tea Rose, Mildred Grant, which created a great sensation when first exhibited, and has maintained its popularity ever since. It has yet to be proved in South Australia, as it was only obtainable here last season, but, as most of the Hybrid Teas succeed well here, rosarians look forward with a considerable amount of interest to the debut of this high-class Rose.

The description of the raisers may be interesting.—Of the many grand Roses that we have succeeded in raising and distributing, this truly magnificent variety stands out pre-eminent, and we can say without fear of contradiction that it is without a compeer.

Mildred Grant.

Never in the history of rose growing and rose exhibiting has any other variety ever obtained such unlimited praise and admiration. The blooms are of enormous size and substance, with high pointed centre, and last long in good condition. The petals which are of unusual length, are perfectly shell-shaped and very massive. The growth is robust, vigorous, and absolutely distinct, every shoot being crowned by a flower-bud which is carried on a perfectly erect and very stout flower stem. The foliage, which is light glossy green, is most striking and attractive. Altogether this is the grandest variety ever raised, and may be termed the Rose of the Century. Color silvery-white, edge of petals shaded and bordered with pink. Awarded gold medal National Rose Society July, 1899; best rose in show, silver medal, Bath, 1900; best Hybrid Tea rose, silver medal, Crystal Palace, 7th July, 1900; best bloom, Manchester, silver medal, 14th July, 1900; best Hybrid Tea, Nation Rose Society, Birmingham, silver medal, 18th July, 1900; best Hybrid Tea rose, Richmond, silver medal, 26th June, 1901; best Hybrid Tea rose, Windsor, silver medal, 29th June, 1901; best Hybrid Tea rcse, silver medal, Inner Temple, 4th July, 1901; and numerous other first prizes.

It may be mentioned that Messrs. Dickson and Sons introduced to the rose world the undermentioned Hybrid Teas, and Teas which have proved some of our most reliable roses, both for exhibition and the garden—Belle Siebrecht, Bessie Brown, Gladys Harkness, Killarney, Liberty, Shandon, Lady Mary Corry, Ethel Brownlow, Mrs. E. Hawley, and Muriel Grahame. At the National Rose Society's Exhibition at the Temple Gardens, London, in July last, the silver medal for the best H.T. and Tea Roses respectively were taken by Bessie Brown and Muriel Grahame.

ROSE MARIE LAVALLEE.

Superlatives are greatly abused froms of speech. But for the benefit of those who grow climbing Roses it is worth saying that a Rose named Marie Lavalee was this year by far the most brilliant and conspicuous of some hundreds of different Roses on a pergola 150 yards long. I believe I got it from Nabonnand, but as I have not his catalogue I cannot be sure. I think it is offered by Guillot as Marie Levalley; I have not yet seen it in an English catalogue.—A. K. Bulley, Ness, Neston, Cheshire.

MAGNOLIA STELLATA.

Is there some sunny sheltered spot in the garden where can be planted a dwarf shrub for spring effect? If there is, nothing more beautiful can be chosen than Magnolia stellata. Dazzling white, each shrub is a mass of blossom. And such blossom!—beautiful, narrow petalled, starry flowers of large size almost covering the dark stems before yet a leaf has appeared. The whole has a truly Oriental appearance, and we hardly need to be told that the shrub has come to us from Japan. In height it does not generally attain so much as 5 ft., but it is of fine branching habit. I have been told that these shrubs should always be planted in the spring rather than the autumn. They are grand subjects for distant effect, and are very beautiful when massed. I saw such a group this spring with all the ground beneath a carpet of Scilla Sibirica; the combination made a beautiful garden picture.

FRITILLARIA ASKABADENSIS.

None of the Fritillarias are quite so stately and beautiful as F. imperialis, the Crown Imperial. But F. Askabadensis is certainly an exceedingly charming variety, of somewhat similar habit, though the flowers are freer and looser. In height it attains 2 ft., and is equally adapted for culture in the rock garden or the perennial border. Moreover, the two flower at the same time, and the pale buff flowers of F. Askabadensis grown as a near neighbor of F. imperialis rubra make a pleasing effect. Like the older form, F. Askabadensis flourishes in a rich, loamy soil. I am rather curious to know if this plant is generally in cultivation. I have searched some of the best known catalogues of growers who make a speciality of hardy plants, and can find no mention of it.

THE POISONOUS HOMERIA.

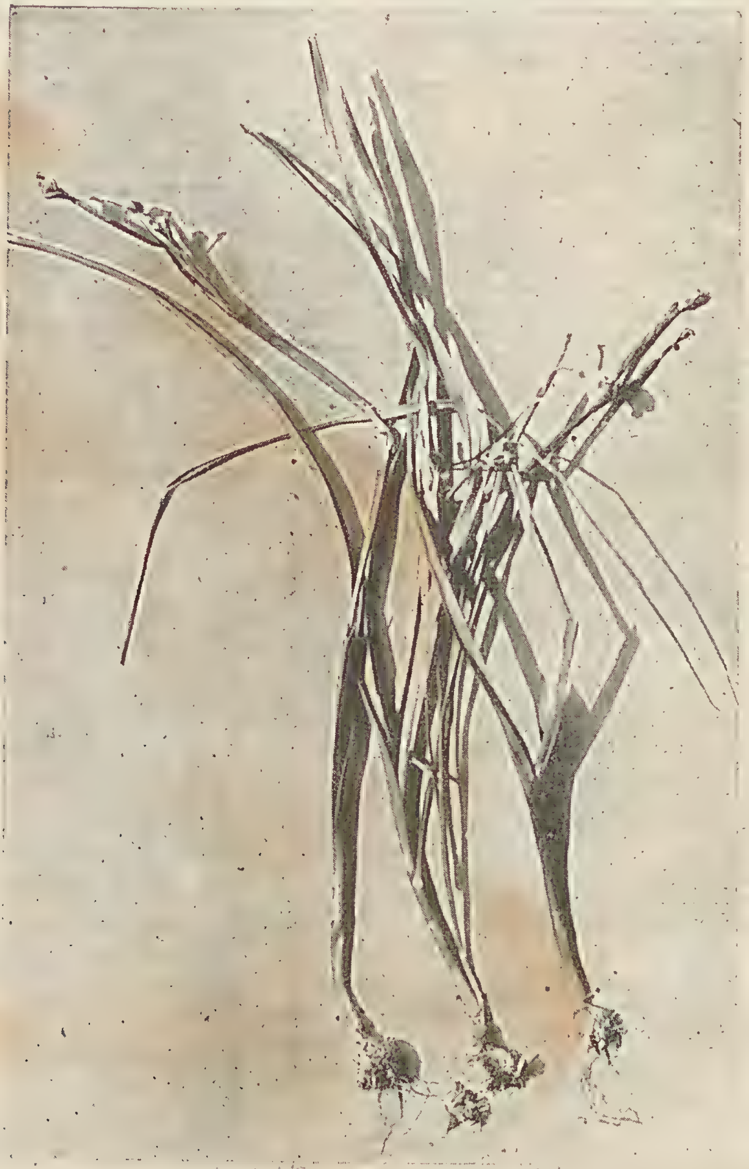
TO THE EDITOR.

Sir—The specimen of a plant you submitted to me is Homeria collina, of Ventenat, variety miniata, hails from South Africa, it being first described from thence in 1799, and belongs to the order Irideae or Sword Lilies. Like all its relatives, it is unsuitable as food for all kinds of stock, and acting like poison when eaten, through causing virulent inflammation of parts of the stomach and the intestines, in many cases resulting in speedy death both for man and beast, but with a difference in symptoms according whether the foliage is eaten, or the tuber. In the first case excessive looseness, in the other excessive constipation resulting. In March, 1893, Mr. D. McAlpine, Government Vegetable Pathologist, Victoria, published an exhaustive description of this plant under the title "Report on a poisonous species of Homeria, causing death of cattle feeding upon it," and illustrated by a large coloured plate, containing a great deal of information. The partial analysis gave no indication of alcaloid poison in the extract, thus apparently indicating that there is no true poison present. Well-nourished cattle or stock used to a considerable mixture of edible and inedible plants, and which have learned to discriminate between them by cautious experimenting, will not touch dubious or dangerous herbage. But ill-fed stock, and such used to cultivated fodder only does so when pressed by hunger, just as men will. Therein lies one mode of avoiding evil results. Plants of the kind unsuitable for food are provided by nature to prevent the ground becoming bare and barren through the removal of the useful ones, its fertility being largely due to the activity of vegetation directly and indirectly. Therefore, as the fodder plants disappear, room is made for the unfit ones, of which they promptly avail themselves. In the case of the Homeria ("Cape Tulip") the eradication by any other means than the choking of the plants by others, such as the Cape Dandelion, etc., through permitting them free growth for several seasons where practical, appears to be the only feasible mode of checking it. The propagation is not only by seeds or tubers, but by exceedingly numerous small bulbils, or minute bulbs, which form in the axils of the leaves above the ground; while below it, the old tubers likewise are converted into such. This is the cause of the rapid spreading of the plant in paddocks, where the natural herbage is kept low by stock in the season of luxuriant growth, and neither pulling out of the plants, nor ploughing nor digging is effective, even when still young, as that merely scatters the bulbils more. I am afraid that effective eradication will prove too expensive, although a mode could be suggested, and that the weed will have to run its course until the soil it affects becomes unfit to support it from its own decayed leavings, when the soil again will bear other plants in exuberance.

I shall be glad to show the pamphlet mentioned to anyone at my room (No. 3, Public Library) and discuss the subject if desired, more fully.

J. G. O. TEPPER.

Norwood, Aug. 28, 1903.



Cape Tulip—Homeria Collina.

The * Orchard.

PRUNING.

W. J. Allen.

[From the "Agricultural Gazette," N.S.W.]

"One of the first things for the beginner to undertake, as he approaches the practice of pruning trees and vines, is to form some conception of the purposes to be served. Imitation is not the foundation of intelligent pruning, though it yields many valuable suggestions. Satisfactory work rests upon a correct understanding of the reasons for each act, and to the attainment of this all study, observation, and experience should tend. Possessing this, one can proceed capably, modifying method to meet condition, and producing desirable results. Receive all suggestions, and then go quietly to the tree and study your problem in its shade. The tree is the best revelator of its needs. Some of our best pruners are men who were untrained to horticulture before they entered upon their orchard work. Reading, discussion, systematic instruction, are all valuable. They save much time and many errors; but recourse to the tree affords the sovereign test of attainment. These may be counted among the practical purposes to be attained by pruning: (a) Convenience of the grower; (b) health and strength of the tree; (c) regulation of heat and light; (d) attainment of strong bearing wood; (e) attainment of size in fruit; and (f) promotion of regular bearing.

"On examining the tree, it will be found to be composed aboveground of a trunk from which the main branches spring, which, in their turn, produce the laterals, on which the shoots and spurs which bear the fruit are to be found. Taking these points into consideration, one can hardly fail to secure rays of light upon the subject of pruning which seem dark to so many.

"Convenience.—Trees which branch near the ground are most quickly and cheaply handled in all the operations of pruning, spraying, fruit thinning, and picking. Low trees with obliquely-rising branches are more easily cultivated than any form with horizontal branches, unless the head is carried so high that the teams pass easily under the tree. To do this sacrifice all the other conveniences and economies which actually determine profit, and is really out of the question from a commercial point of view.

"Health and Strength.—It is imperative in most parts of this State that the sunshine be not allowed to touch the bark during the heat of the day. This protection is secured even for young trees by low branching. The low tree with properly spaced branches attains superior strength by virtue of thick, strongly knit, short growth between branches, and by its strong, stiff, obliquely-rising growth sustains weight which brings horizontal branches to the ground, and thus even high-headed trees are liable to continually increasing interference with cultivation, and the desperate grower has to raise the head of his tree higher into the air and farther above the profit line, while at the same time he renders it more liable to sunburn, to bark-binding, and to unthrift by forcing the sap to flow an unnecessary distance and through wood and bark which impede its movement. Besides a low tree escapes stress by strong winds which a high tree invites, and at the same time is less able to withstand. Pruning for health and strength of the tree also includes the removal of unthrifty or diseased parts, which are not only an encumberance to the tree, but may communicate to other parts the causes of their ill condition.

"Heat and Light.—The maintenance of strong bearing wood in the lower part of the tree is conditioned upon the proper pruning of the top of the tree. How far the upper levels or the shade layer of the tree can be safely opened, depends upon the local climate in each fruit region. The rule must be the higher the summer heat the denser the tree—the lower the heat the thinner the tree; but everywhere the proper condition of openness must be constantly in view in pruning. Not alone must this be done to maintain thrifty growth below, but it is also essential to the best growth and ripening of the fruit in the lower and interior parts of the tree. Fruit inferior in size, color, and quality, results in part from lack of pruning to regulate the admission of light and heat, sometimes one, sometimes both, to the shaded portion of the tree.

"Bearing wood.—Good fruit develops on good bearing wood, and good bearing wood is the product of proper degrees of light and heat as has just been urged; but bearing wood in the case of some fruits is new wood, and reduction of old wood for the purpose of forcing the growth of new wood must be constantly in mind. Renewal is more or less a consideration with all trees, and especially the securing of strong new wood. This is a point upon which close study of the bearing tree will yield most satisfactory suggestions.

"Size of Fruit.—The size of fruit, providing the tree is healthy and vigorous, depends upon the character and amount of bearing wood which the tree is allowed to carry. Removal of part of the fruit burden is done by thinning after it is well set, but this labor should always be minimised by antecedent pruning, which adjusts the retention of bearing wood, according to the vigor, size, and bearing habit of the tree. Thinning out of bearing shoots and spurs, when either are clearly seen to be in excess, should be the constant study of the pruner.

"Regular Bearing.—This point is largely involved in the preceding and affords an additional incentive. Regulating the amount of fruit borne in one year involves the profit of two years because a tree cannot produce an excessive amount of good fruit and perfect fruit buds for the following year. It may generally make buds which will bloom but not always that. If it does make the bloom, it is no guarantee that the bloom will be strong and effective for bearing. Consequently pruning for reasonable amount of bearing should always be borne in view, and should be practised at the close of the year of nonbearing with particular diligence, if the alternate years bearing habit is to be broken up."

The foregoing are among the practical purposes to be served in pruning, and it will be seen that there are various ends to attain; therefore have an ideal towards which to work and always have an object in view when severing branches, shoots, or spurs from any portion of the tree; never by any chance losing an opportunity of picking up any points from your neighbor.

FORM OF TREE.

The form of tree which in New South Wales has been found to give the greatest satisfaction is the low vase form (sometimes called the goblet form), and which shelters the fruit as well as the trunk, and also the ground in the immediate vicinity of the tree from the hot summer winds and sun, and minimises their effects. In pruning for this form the central branch is cut out and the tree is so formed as to leave the centre of the tree quite open, and the fruiting wood is so guided that the centre, as well as the outside and the bottom as well as the top, has plenty of room and light to develop good fruiting wood in every portion of the tree. In confining the tree to this form it may, to a certain extent, tend to give it a dwarfed appearance; but this is of little moment in comparison with the many advantages which trees so trained possess over the high stemmed open centred, long-limbed shape in our very hot districts. The weight of the fruit is borne by strong, sturdy branches, which will not bend and swing with every breeze which blows, and while the fruit may tend to spread the main branches a little, even this has no ill effect as the young growth found shooting out of the branches and laterals is sufficient to shade the interior of the tree to such an extent that no harm befalls it. It is well to see that the main branches do not start from the trunk too close to each other. It is best to start them from different points radiating around the tree and at equal distances apart from each other.

PRUNING TO OBTAIN A LOW HEAD AS APPLIED TO DIFFERENT VARIETIES OF TREES.

It is as well to begin with the tree from the very start, which is at the time when it is transplanted from the nursery to the orchard, as a good beginning is half the battle. Assuming that a tree is about to be planted out, the first thing to do is to examine the roots carefully to ascertain how they have fared in their removal from the nursery, as it is often found that the roots have been badly mutilated, especially in this country, where proper tree lifters or diggers are seldom used. Before planting, all roots which have been broken or damaged should be cut away and all the young roots cut back to from within 6 to 8 inches of the tap root. All small roots may be removed, leaving only the larger ones, as by digging up a tree which has been planted for some time it will be found, except in very rare cases, that the very small roots never throw out any young rootlets, but wither away and die, becoming a hiding place, perhaps, for the white ants, which often in time, through such medium, take possession of the tree and cause its ultimate death. The roots should be cut with a sharp knife, and in such manner that when the tree is planted the cut will face downward. By cutting this way, new roots, which will form or rather grow from the cut, will have a tendency to grow in the required direction—downward.

The next step to consider is as to how the top of the tree shall be dealt with This, of course, will depend largely on the age of the tree in question. If a two or three year old nursery tree, it may be advisable to leave either three or four short arms, as it is found that if the head is cut away, and only a straight trunk left, the top of the tree may not shoot, but will die, and the tree shoot from the root. This is often the case with the peach, but where a few shoots are left this danger is avoided. If a well-grown yearling tree, I would prefer cutting it back to a single stem. It must be borne in mind always that in moving a tree it loses the greater portion of its roots, and that in consequence the remaining roots are unable to sufficiently support or nourish the growth above ground, for which the whole root system was intended. We must, therefore, shorten the top in such a way as to re-establish the lost equilibrium, and the planter must bear in mind that is is always better to cut a newly-planted tree back rather severely than to leave it with too much top, as by so doing it will recover more quickly, and in the end make a much better tree.

Vegetable Garden.

OPERATIONS FOR SEPTEMBER.

By W. S. Campbell.

Judging from the cold weather experienced in July and August it is probable that we may have a late spring.

This is one of the busiest times of the year with both vegetables and flowers in sowing, planting, pruning, lawn-making, walk-making, &c.

With a good start in the spring, the

chances are in favor of a good vegetable supply in the summer.

So far the season has been favorable as regards rainfall for the garden, for over a vast portion of New South Wales the ground is in a satisfactory condition, and the prospects of good rains during the coming summer seem to be satisfactory.

Whilst there is yet time a sufficient extent of ground should be prepared on which to carry on a succession of vegetables; not that it need take a very extensive space in which to grow all the vegetables needed by a fair-sized family if proper economy be carried out. The great point to keep in view is, never to allow any part of the vegetable garden to remain unoccupied longer than can possibly be avoided. Use abundance of good dung for all vegetables, and, if possible, use it in a well-rotted condition, without the best part, or the soul of it, so to speak, having been washed away by rains.

Asparagus.—August is a good time to plant this useful vegetable before the shoots have started into growth. If plants have been raised from seed, they can be moved without much injury to their roots. Should, however, roots be obtained from other gardens the chances are that many roots will be injured, bruised, and broken. Look well over the plants before planting, and remove with a sharp knife all bruised and broken roots, and trim all rough ends. Make wide trenches, with the bottoms raised in their centres an inch or two, so that the crowns of the plants may stand higher than the ends of the roots, which should be well spread out. When filling in the trenches with soil, shake fine soil well in amongst the roots, and when the work of filling in is finished, the soil should be about 2 in. above the crowns of the plants. The rows should be about 18 in. to 2 ft. apart, and the plants about 18 in. apart in the rows. The spaces between the rows might be made use of for quick-growing vegetables, such as lettuce, mustard and cress, radishes, and other salad plants, which should be fit for use before the asparagus shoots make too dense a covering. Old asparagus beds should be cleaned up, and a good dressing of farmyard manure might be forked in amongst the plants without interfering with or injuring their crowns. As the asparagus is a native of the sea coast, where the sandy soil is impregnated with salt, it follows that an occasional dressing of coarse waste salt would be likely to prove beneficial.

Artichoke (Globe).—Young plants or suckers may be planted out. A very few plants will prove sufficient for any family.

Artichoke (Jerusalem).—Plant out during the early part of the month as large an area of ground as can be spared. If more tubers are raised than the family can consume the spare ones can be used with advantage by pigs.

Beans (French or Kidney).—These are tender vegetables, which should not be sown until frosts are unlikely to occur. Use plenty of farmyard manure when preparing the ground, and sow in rows about 2 ft. 6 in. apart for dwarfs, and 4 ft. or so for the tall-growing kinds. Sometimes it is a good plan to sow the tall beans in double instead of single rows, and this is worth trying. Sow the beans 3 or 4 in. deep and 4 to 5 in. apart in the rows.

Beet (Red).—Sow a little seed during the month in sufficient quantity for requirements. It is much better to sow from time to time than all at one time, as by that method a constant succession can be kept up, except from some unavoidable accident; and the same system should be carried out with all vegetables. Beet seed sometimes takes a good while to come up after sowing; but if it be soaked well, or spread out on a moist bag and covered with another moist bag or some material that will retain moisture well, such as old flannel or something of that kind, the beet seed will germinate in a few days; but the bags or flannel or other stuff should be kept moist. As soon as the first sign of the bursting of the seeds' coats can be detected, the seed may be sown, but the soil should be watered after the seed is sown. Unless this be done the seed may perish if the soil is dry. Drills should be about 18 in. apart, 1 in. deep. Cover with fine soil and press this down about the seeds. Thin out seedlings to 9 in. or 1 ft. apart. Sow the globe varieties in preference to the long tap-rooted kinds.

Silver Beet.—One of the most useful of vegetables; is not grown so largely as it merits. It is to some extent, if the term may be used, a permanent vegetable—that is, the leaves may be pulled time after time for a considerable period if the plants be well treated and looked after. Sow the seed in a seed-bed, and transplant when the seedlings attain a few inches in height to a well-manured bed, where they are to remain.

Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Savoy Red Cabbage.—Sow a little seed of each of these vegetables occasionally during the month, and plant out from former sowings, or from beds where plants have been pricked out. Use abundance of good farmyard manure for all these vegetables, and cultivate the soil between them frequently as they are growing.

Celery.—Sow a little seed, either in seed-bed or box, where it can be carefully attended to. Pick out the seedlings when large enough, and transplant when they have made sufficient growth to very heavily manured shallow trenches.

Celeriac (or Turnip-rooted Celery) is worth trying. A little seed may be sown in a seed-bed or box, and the plants treated as ordinary celery; but they may be grown on a flat bed, and they will not need earthing up or blanching like celery.

Carrot.—Sow a little seed from time to time. Thin out the seedlings well as soon as they are an inch or two in height. Keep the carrots from weeds, and run the hoe between the drills frequently.

Cucumber.—Sow a few seeds in a warm corner under shelter, and plant out the young cucumbers when large enough to move. In cool districts the plants should be well protected from frosts at nights.

Leek.—Sow a little seed, in a seed-bed, of this useful vegetable, and transplant the young leeks when they have grown to about the size of an ordinary pen-handle, or larger. The leek needs very rich soil to enable it to grow to the greatest perfection. Plant in shallow trenches, so that water and liquid manure can be most easily applied.

Lettuce.—Sow a little seed in a seed-bed, and plant out when large enough to handle. Seedlings, which may be available now, should be planted, a few at a time, in order to keep up a succession.

Melons.—Sow in the open ground in the warmest localities; but in the cold districts seed should be sown under protection.

Onion.—Seed may be sown largely during the month. Drain the beds well, manure heavily, and make the surface soil as fine as possible. Sow in drills about 12 or 15 in. apart, and do not cover the soil more than half an inch with soil at the most. Keep the young onions free from weeds when they come up, and thin out as the plants become strong. For the production of pickling onions sow the seed broadcast thickly. Try seed of potato onion, Brown Spanish, White Spanish, Anderson's Market Model. The last-named is a beautiful onion worth trying.

Parsnip.—Sow as largely as may be required during the month. Dig the soil deep, but avoid using manure if it can be avoided.

Peas.—Sow extensively from time to time. Dig the ground well, and use abundance of manure. Provide sticks or supports as soon as the young peas appear. Keep well weeded and do not earth up the peas. Bonemeal, superphosphate of lime, lime, or gypsum will be found useful. But do not add ordinary lime to stable or farmyard manure. Apply it either to the soil before or after applying the dung. Yorkshire Hero is one of the most useful varieties to grow.

Potato.—Plant a few rows of Kidney potatoes or the Early Rose. The ground should be well drained, and if not of good quality should be heavily manured with farmyard dung. Plant in rows about 3 ft. apart, and drop the potatoes about 1 ft. apart in the rows 5 or 6 in. deep.

Radish.—Sow a little seed from time to time to keep up a continuous supply.

Rhubarb.—This may be planted out at any time during the month. Manure the ground heavily, mixing the manure thoroughly well with the soil. If the soil be of very rich quality the manure need not, perhaps, be applied. Plant the rhubarb so that the crown of the plants be covered with about 2 in. of soil. Spread a mulch of stable manure over the top of the bed. Clean up old rhubarb beds and fork in a dressing of manure. Then spread a mulch around and between the plants.

Salsify.—Sow a little seed in drills about 15 in. apart. When the plants come up thin them out to about 5 or 6 in. apart in the rows.

Turnip.—Sow a little seed in drills about 1 ft. or 15 in. apart.

Tomato.—Sow seed when convenient, and plant out any young tomatoes which have already been raised for the purpose. When frosts are likely to occur protect the planted out tomatoes at night.—"Agricultural Gazette of New South Wales."

Scientific.

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FERTILIZATION OF FLOWERS.

[BY SIGMA.]

III.

The Condollea (stylidium) is a native plant common around Adelaide. The mechanical arangement provided for supplying the bees which frequent it with pollen is remarkable. In the centre of the flower is a long column, which is really the pistil and stamens combined. At the end is the stigma surrounded by anthers. The latter ripen first, and have dried up and fallen away before the stigma matures. This elongated column is very sensitive, and acts as follows: A bee is guided to the honey in such a way that it must touch the sensitive base of the column. Immediately the column springs up, and if the bee is large enough, receives the pollen from the anthers. It is almost pinned down to the tube of the flower, and has to wriggle sideways to get out, thus helping to brush the pollen off the anthers. The column after a while returns to its former position, and subsequently is ready when the stigma is ripe and the anthers have dried away, to spring up again and collect the pollen from the back of a bee which has just come from a younger flower. The action may be imitated by touching the column with a piece of wire. The fifth petal has formed into a sort of lip, which is provided with horns. These latter guide the column on its way back, and steer it to its correct position.

Grevillea has the stigma doubled up out of the way until the anthers have ripened.

Mimulus has a style divided into two plates. As the insect pushes past into the flower one of these plates is bent down and sweeps off the pollen. As the insect emerges, this plate, being elastic, springs back against its fellow, and any new pollen collected from the anthers of the flower rubs against the lower insensitive side of the plate.

ORCHIDS.—Orchids being peculiar in structural arrangement, are particularly worthy of study. On a column facing the lip of the flower are the stigmas and the anthers. The latter are situated at the top of this column, and the stigmas are below to the right and left. The column is prolonged into a rostellum or beak. The pollen is in large masses, each of which is upon a stalk. Although the pollen is in such a position that it might fall on the stigmatic surfaces, the latter are protected from it. Also the pollen is not in small grains ready for dispersion, and each mass is firmly fastened by its stalk to the column. If a small piece of stick be pushed in against these pollen masses they adhere and stand erect; if now they be watched for a while they will be seen to bend downwards and slightly outwards. The reason is obvious. A bee carries them away; if they remained erect they would simply be placed back again into the same place on another flower. However, after they bend forward they are exactly in the right position to strike the stigmatic surfaces. On contact with these latter small portions are torn away, and adhere, leaving the remainder for fertilising other flowers. Only one orchid has dry pollen, but a sticky material is exuded to make it adhere.

The Catasetum is an orchid with male and female flowers separate; consequently it must be insect fertilised. It is remarkable for having the pollen masses on the end of a very sensitive curved stalk. When a bee alights on the lip it moves the long antenna-shaped appendage which acts like a trigger, and causes a fine membrane to break away and release the pollen stalk, the latter being in a high state of tension. Darwin tried the experiment of touching the trigger with a hair, and found the pollen masses were projected 3 ft. on to a piece of glass placed in the line of fire.

In order to prove to you that certain insects are indispensable for fertilising certain flowers I may cite the case of the English clover, which was planted in New Zealand. No seeding took place until the bumble bee was imported from England for that purpose. Seed readily formed after the arrival of that useful insect.

"In general, different groups of insects according to their sense of taste or color, the length of tongue, their movement and dexterity have produced various odors, colors, and forms of flowers. Insects and flowers have both progressed towards perfection," so says one writer.

As an example, one tropical orchid has a spur 12 in. long, and can only be fertilised by an insect which has a proboscis of that length. Insects with shorter tongues would not visit the flower, as the honey would be inaccessible to them.

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LEUCOJUM HERNANDEZI.

There is a dainty half-wild beauty in the Spring Snowflake with its white, drooping flowers borne on a stem not much under 2 ft. in height. Its long sword-like leaves are of an intense green color. The plant is seen to the best advantage in the wilder portion of the garden, and in this it resembles the blue-flowered Commelina. Both are apt to be eclipsed by more showy subjects in the ordinary border; but see them in some spot given over to ferns, some copse under deciduous trees, and then we appreciate fully their delicate beauty and graceful growth. Leucojum Hernandezi is considerably taller than the well-known L. vernum; indeed, it is more closely allied to the Summer Snowflake, L. estivum. It should be noted that when the Leucojums are lifted and dried they should be amongst the first bulbs to be replanted in autumn, as it is not advisable to keep them out of the ground long.

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BRODIEA UNIFLORA.

This plant is sometimes known as Triteleia, or the Spring Starflower. It is certainly one of the most beautiful of our early flowering bulbous plants, and deserves a place in every garden. I saw it growing lately in an old-fashioned garden, where it had been left undisturbed, and had grown into large bold clumps. The pale flowers, faintly tinged with color, are large, and are charmingly displayed growing out of a carpet of blue Forget-me-Nots. The plants need a sunny position, but are not particular as to soil. There are many other varieties of Brodiea that are far too seldom seen.

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THE CATERPILLAR PLANT.

Doubtless the long-suffering amateur would not hesitate to apply this name to many of the subjects in his garden, whose proneness for the company of caterpillars would render the application justifiable. The real Caterpillar Plant, however, is very rarely seen in cultivation, and probably most people have never seen it. It is a hardy annual from Africa and Southern Europe, and belongs to the great Pea family (Leguminosæ).

Unlike most members of the family, it is, however, rather lacking in beauty, and were it not for the very curious seed pods it bears would probably be entirely ignored. It is these which give to the plant its popular name; they are borne singly on stalks from the axils of the leaves, and so much resemble caterpillars in their shape and markings as to make the bestowal of the name comprehensible.

Seeds are sown in the open in spring, and the plants treated in the way usual with hardy annuals; but as they do not make a great floral display they may have any odd corner of the garden allotted to them. Scorpiurus is the Caterpillar Plants's generic name, and vermiculata is the species most generally grown. It blooms in June or July.

E. J. C.

Royal Agricultural and Horticultural Society.
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JOHN CRESWELL, Secretary.

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The Flower Garden

OPERATIONS FOR OCTOBER.

Gardeners who have been industrious will reap their due reward of pleasure this month particularly, and succeeding months of brightness in blossom. Those who have not been industrious may envy those who have. The season is most bountiful, but the bounty of Nature requires attention. We are looking forward to the Horticultural Show on the 22nd of the month as promising the finest display of flowers ever gathered.

Edgings that have not been trimmed should be clipped before the summer sets in, and any gaps filled. Lawns should also be planted. We notice that the Buffalo Grass is still the leading favorite, and several lawns are being set out with it. There is nothing to say against it, but it does not compare with the old English meadow grass, Poa Pratensis, for general utility and beauty. It never looks ugly, and has no worn-out period like other grasses. Summer and winter alike it retains that even softness and lovely green color for which England is so famous. We cannot understand why it has not gained in favor here.

The highly favored Carnation, which is fast coming into vogue, will soon be showing all its beauty. The chief assistance required by this plant with many gardeners, who do not make a specialty of it, is to keep it from flopping about in an ungainly fashion peculiar to its natural habit. Wire-netting is no doubt the most simple and effective method of dealing with the plants.

We would like some of our professional gardeners to explain the reason why they have allowed the once popular Verbena to go out of cultivation. We cannot help thinking that they are to blame for the scarcity of this beautiful flower. It is rarely seen now, even in the cottage gardens, where at one time it was grown in preference to most other flowers. The varieties contain some beautiful colors, they are exceedingly easy to cultivate, and make a rare good show. They can be planted now, and we hope to see a revival in their cultivation.

Petunias, too, promised to have a run. But the interest in them seems to be flagging. They make a bonny bright show of coloring in the spring and summer, and are very effective. Cinerarias, too, have never been cultivated as they should be. Most people seem to have a notion that they are only suitable for the glasshouse. This is a great mistake. They can be grown in the open garden as easily as Geraniums. They carry a magnificent display of colors, and are most profuse bloomers. It is too late now to bed them out, but attention being directed to their beauty, as now in bloom might induce gardeners to remember them for sowing next season.

We are pleased to note that Portulacas are receiving more consideration for summer blooming. They are quite fascinating when on the hottest day they seem to smile and revel in the glowing sun, while other flowers droop and wilt. They can be set out now, and the double varieties have some rare beauties amongst them.

Plant out some Ipomaeas for trailing on fences, against walls, or for trellising. They like the summer sun, and look very gay, especially in the early morning.

Do not forget the gay Zinnias. No sun is ever too hot for them, and they throw some lovely blooms when every other flower is drooping in the sweltering heat. Plant them out now.

When bedding out your Sunflowers and Rudbeckias, remember that they are tall growers, and if put in front of smaller flowers will hide everything.

Mimulus are pretty flowers very much neglected. Set out a few plots of them, and you will be surprised at the effect.

Fuchsias are beginning to put on wood. Pinch them back; also Begonias and Justitias. Syringe your Roses for aphis, and sulphur them for mildew.

Grasses are always wanted for decorative purposes. Plant some now, such as the Feather Grass (Stipa pennata), Hare's Tail (Lagurus ovatus), Eulalia Japonica, and the Himalayan Grass. If cut before seed formation they will adorn the best of rooms indefinitely.

We have been supplied with a report of a paper upon flowers for cutting, by Peter Bisset, of the Washington Florists' Club, published, we think, in "The Florists' Exchange." The months mentioned throughout the paper correspond with our September and October, and is interesting, therefore, to our readers at the present time.

FLOWERS FOR CUTTING OUT OF DOORS.

(Read by Peter Bisset before the Washington, D.C., Florists' Club).

Daffodils open the season for outdoor cut flowers about the second week in March. By planting liberally of the well-known forcing varieties we can get a supply of very fine flowers for cutting. We have cut extra fine blooms from Horsfieldii, Empress, Emperor, and Trumpet Major. The earliest to flower are Princeps and Golden Spur.

Daffodils will be followed closely by the Jonquils and the Narcissus poeticus in succession. I would strongly recommend to those who have the ground to spare to plant all the bulbs of Daffodils you can. The bulbs you have forced in the greenhouses during the winter can be planted out of doors, and the second season after planting will flower abundantly, and in a few years you will have a fine lot of flowering bulbs.

A little later, about the 18th, we have the Magnolia stellata, sometimes called Halleana, and the first of all the Magnolias to flower, giving semi-double blooms of white color and delicious fragrance. This is a shrubby variety, and never grows to the height of the better known Magnolia conspicua, but when in flower the whole bush is literally covered with beautiful star-shaped blossoms.

Flowering at the same time is the Forsythia suspensa, a very satisfactory shrub, with its long sprays of lovely yellow flowers; it lends itself to house decoration well, and a large vase of it always attracts attention. This is followed by Magnolia conspicua, which well repays one for the space it occupies. Every spring it is covered with large cup-shaped white flowers, and is well worth growing for cut bloom. Next come the Hyacinths, about the 26th of March, and if planted in good season in the fall, and in good soil, they will surprise one who knows them only as forced in the greenhouse.

Flowering at this time, the third week in March, we have the Forsythia viridissima, which, while not quite so effective as Forsythia suspensa, flowering a little later, lengthens the blooming season very acceptably. This variety grows more erect, and without the drooping habit of suspensa.

April brings with it Tulips in all their bright and gorgeous colors. The bulbs should be planted in good soil, and as soon after the month of October as possible.

During the first week of April we have generally the double flowering cherries, and I cannot too strongly recommend this class to florists for cut flowers. The best, in my judgment, is the pink Japanese, Cerasus Sieboldii rubra-pleno, flowers semi-double, white, tinged with red, lasting well when cut. The best white is Cerasus sinensis flore-pleno, growing to a good-sized tree, and while in flower the tree is a mass of white blossoms.

Flowering with the cherries are the double flowering peaches. In Persica vulgaris flora alba plena we have a beautiful small tree, the branches entirely hidden by its white flowers, which are perfectly double and last well in water. In Persica vulgaris rosea plena, we have the counterpart of the white, except in color, which is a beautiful rose color, as its name implies. The same may be said of Persica vulgaris sanguinea plena, which is a beautiful bright red, and is very fine, almost as deep in color as the Crimson Rambler Rose.

Next come the double flowering crab apples, wonderful in their wealth of blossoms. The flowers shade from white to pink, the two colors making a beautiful combination. The Pyrus angustifolia (sometimes called Betchel's rose-flowered crab) is one of the very finest of the flowering crab apples. The tree is of medium size, and the flowers are quite fragrant and of a beautiful delicate pink color. The Pyrus malus spectablis rosea plena is another crab apple that deserves to be more freely planted. The flowers are double, rose-colored, and quite fragrant. All of the crab apples stand well in a cut state, and should be more planted for florists' work, especially for decorations of stores or dwellings.

The second week in April finds Exochorda grandiflora in bloom. Beautiful as this shrub is in flower, I am sorry to say it will not last long enough when cut to make it profitable for florists.

The Japan quince is in all its glory at this time, ranging in color from deep red to white, lasting well in water. We find it very useful, and believe florists would find it profitable to grow for cutting. The 20th of April brings us to the Dogwoods, and if you have not already planted the pink-flowered variety, be sure to do so next fall. And plant plenty of it, as there is a great future for it, both for cut flowers and for lawn decoration.

We find it a fine thing for cutting, lasting well in water, and a branch each of the pink with the white make a very beautiful combination. In ordering the pink-flowered variety be sure to state expressly that it is Cornus florida rubra that you want. I have known of quite a number of people who sent for the red Dogwood and got instead the red stemmed Dogwood Cornus stolonifera, or sanguinea, and would not believe the nurseryman had sent them what they had ordered.

Blooming at the same time as the Dogwoods we have the Styrax obassia, another white flowering small tree from Japan, flowering in drooping racemes, about five inches long, on the short lateral shoots; the flowers are quite fragrant and useful for cutting.

The Lilac is in bloom with us about the third week in April, and should be largely planted. The plants you have forced for winter flowers and did not succeed in selling will, if planted out, in a few years, make fine, profitable bushes. Care must be taken, however, to remove all suckers, as the finer Lilacs come grafted either on the privet or common Lilac, and if the suckers are not removed the stock will soon outgrow the more desirable variety, and your improved plant be lost. Varieties we can recommend are: Princess Alexandra, pure white and one of the finest; Emil Lemoine, rosy Lilac double flowers, very large and of fine form; Marie Legraye, large panicle, white flowers (this also makes a good forcing variety), Lovaoriensis, single flowers, silvery pink color, panicles erect and very large; President Grevy, large flowers, double, blue color.

Another fine shrub or small tree that has not received the attention it deserves for this purpose is the Xanthoceras sorbifolia, from China. The foliage is pinnate, like that of the Mountain Ash. The plant flowers in clusters of white racemes with a yellow spot in the centre of each bloom, which changes to reddish purple. It flowers about the third week in April, and is a very free bloomer; the flowers are of great beauty, and last a long time when cut. This would make a very desirable plant to force for winter bloom as a pot plant, and I am sure there will be quite a demand for it when it becomes better known.

The English Hawthorns are all in flower at this time, and in Cratægus oxyacantha coccinea flore pleno Paulii we have the very best of the double scarlets, and in Cratægus oxyacantha flore pleno we have the finest of the double whites. The double are much superior to the singles for cutting, although the singles are much more fragrant.

The Spiræas are in full beauty at this time. Especially desirable for cutting are Spiræa Van Houttei, which never fails to give plenty of long sprays of beautiful flowers, and Spiræa Reevesii, also a fine shrub, and cutting, though not flowering quite as freely as Van Houttei, although I consider it handsomer than the latter, both in flower and leaf.

The last week of April brings the Snowballs, the first to flower being Viburnum opulus sterilis, and it is a beautiful shrub, literally laden every spring with large balls of white flowers. Closely following is the Japanese Viburnum picatum. This is considered by most people the handsomest of all the Snowballs; but to me Viburnum opulus sterilis is the finest. Its habit of growth is more graceful, and its flowers, borne on longer stems, droop very prettily, while V. plicatum is very stiff and erect in growth and flower, and the individual blooms are not as large as those of V. opulus.

The Mollis and Ghent Azaleas flower at this time, and in this class we have some very beautiful colors. The hybridizers have been at work on this class of plants, and the result is a greater range of color with increased size of flower. The colors range from light cream through the shades of yellow, to pink and red. The flowers are very fine for cutting, and last for several days in water. A list of varieties should include the following fine sorts: In the Mollis class we have in Alphonse Lavalee, a bright red; Chevalier de Reali, light yellow; Comte de Gomer, soft red; Comte de Kerchove, pale orange; Comte de Papadapolie, fine red; Comte de Quincy, yellow; Dr. Leon Vignes, yellow; Mad. Arthur de Warreles, rose. In Mollis hybrids that are very fine, Dulcinee, salmon yellow; Frere d'Orban, creamy white; General Goffinei, violet; Henry Consciense, pink; Oswald de Kerchove, carmine. In the Pontica section, Daviesi, pure white; Gloria Mundi, clear orange; Grandeur Triomphant, violet red; Pallas crimson. In the double flowering, Ghent section, the following are good: Arethusa, rose and yellow; Byou de Gentbrugge, light rose; Mina Van Houtte, cherry red; Raphael de Smet, rosy red.

BULBS TO GROW AMONG OTHER PLANTS.

Both in beds and borders the inclusion of bulbs among other plants is a system to be highly recommended; indeed, I know of no disadvantages that it possesses. A succession or a combination of flowers is thus obtained; the perennials or annuals hide the yellowing foliage of the bulbous plants, which can remain in the ground either altogether or long enough to perfect their growth ready to yield fine blooms a following year.

If this subject were thoroughly studied, and the merits of this style of planting realised, there would be no Pansy bed without its show of Narcissi, Gladioli, or Montbretias; no Dahlia ground that had not shown Liliums earlier in the year; no Carnation collection that would not be also a Narcissi, Ixia, or Spanish Iris collection!

There is no need to grow the two kinds of plants so closely as to injure one another, when both happen to be great nutriment devourers, for instance; in the case of Snowdrops, Crocuses, Scilla Sibirica, the small Muscaris, light growing Ixias, Sparaxes, and Montbretias the bulbs and the roots need not be more than a few inches apart for all to thrive.

A truly lovely bed can be composed of Delphiniums (blue) and white Spanish Iris, as these are in flower at the same time; and there is no reason why some Narcissus poeticus and blue Scilla should not have offered the same delicious color harmony in the same bed during the spring.

One of the most showy and useful plants in my garden is the Sweet Rocket; the plants are from seed, and show a variety of shades of mauve, some of the flowers being streaked with white, while those on other plants are so deep in tint as to be nearly purple. These old-fashioned beauties are happily associated with yellow and brown and gold and white Spanish Irises, while, long before they were more than green plants springing hopefully from the winter soil, the earth all round was gay with double Daffodils.

Oriental Poppies are grand when in blossom, but during the spring their foliage will look elegant rising out of Tulips, either scarlet or mixed colors. Some Montbretias or Schizostylis coccinea in addition will ensure vermilion blossoms later on. A carpet of purple Crocuses over a large stretch of ground gives a warm, welcome effect in March; among the Crocuses any of the late flowering perennials may be sending forth young green shoots, and when the Crocus foliage is yellow and unsightly the new herbaceous growth will spread out and mitigate, if not altogether hide, the unpleasantness.

An Iceland Poppy bed makes an excellent Hyacinth bed in spring, if the plants are alternated with the bulbs; when May is on the wane and the Hyacinths are lifted Violas can be put into the empty spaces, or Anemone coronaria tubers, and there will be no more trouble needed for one summer. Phloxes that flower very late should be alternated in the beds, or kept company in clumps in the border, with purple German Irises; both being strong growers, the ground must be kept well enriched.

Aquilegias begin to look pleasing quite early in the spring, but when they are done blossoming, in June or July, Lilium candidum should be coming into snowy loveliness, while a few autumn flowering Gladioli will keep the bed or border sufficiently attractive until the beginning of winter.

Early flowering Chrysanthemums are often cultivated in a prominent bed or border, which certainly needs to have other plants admitted into it if prettiness is to be enjoyed from March to August. A good deep border of mingled Daffodils and Leucojum estivum (May blooming Snowflake), and an inner sprinkling of alternate bulbs of Spanish Irises in different shades, will enable the gardener to see and gather attractive blossoms long before the Chrysanthemums can become a joy to him.

In the same way, the place where Michaelmas Daisies are growing should be spring brightened by gorgeous Tulips, and summer adorned by Gladioli; in the Tulips even a succession may be worked for by raising some Duc Van Thols, some double, and some Parrot Tulips, or Darwins, Peony beds, which have of necessity to be well looked after in the matter of enrichment, are very suitable sites, in full sunshine, for displays of Lilium auratum, which we most of us grow now. The Peony plants afford the Lilies some shelter from too scorching sunshine, as well as from the full blasts of cold winds, and also help to retain moisture in the soil.

M. Hawthorne—The Gardener.

THE TULIP FANCIER'S APOLOGY.

The English Tulip, much in evidence at the Drill Hall on Tuesday, is, with the Auricula, the peculiar stronghold of the florist pure and simple. Of course, Roses, Carnations, Dahlias, and even Daffodils are shown and judged on severe florists' lines, but they are also common objects of the garden, whereas the fancy Tulip and the Auricula belong to a few enthusiasts, who criticise them by certain traditional set rules, somewhat of a wonder and a mystery to those not in the secret. An infinite variety of Tulips is nowadays to be found in our gardens, from the early bedding sorts which make large sheets of smooth color in the parks to the slender Florentine Tulip, with its drooping head and exquisite scent, so common in the southern vineyards, or Gregii all scarlet and gold above the broad leaves purple-spotted like the Woodland Orchis. Yellow is perhaps the prevailing color in the genus, but browns and purples and every shade of rose and scarlet are there; some have long petals that fold together like dogs' ears, some again are pointed and reflex in gracious curves so that the widely opened flower has almost a starry aspect. But the hardened florist will have none of them, for him they are "garden Tulips" not "Tulips;" his flowers must be shaped like a cup with smooth rounded petals, the blue or black blotch that is so general must be replaced by a clear circle of white or yellow at the base of the flower, and while he admits a certain number of self-colors his most cherished blooms are streaked and striped on a determined plan. A narrow scheme that cuts out much beauty, one is at first inclined to say; and indeed it would be easy to criticise the effect of Tuesday's show, even after making allowance for the unkindly weather, a terrible upset of the calculations of all gardeners. A row of green-painted boards in which the blooms are stuck at regular intervals, no foliage, not even the stalk, visible; the loveliest flower in the world is robbed of its grace and dignity by such treatment. But this criticism is really wide of the mark, a florist's show is a competition not a display, and the flowers must be set out so that they may be minutely scrutinised; defects and good qualities are to be nakedly displayed and no artistic arrangements can be allowed to cover flaws in growth. Watch the judges at their task, they peer closely into each flower, take it from its stand, and turn it about, they match it with a rival bloom from another stand, in their minds they carry a standard, and point by point they decide how far the flower conforms to their ideal. Thus the green boards or something equivalent to them are a necessity; the flowers must be wholly accessible to examination, and neatness is the only general effect that is attainable.

But why have a standard at all is the next question raised. A flower is grown for its beauty; why not judge it simply by its beauty and leave line and rule alone? Indeed the florist of late has come in for a good deal of denunciation, not only are his formal standards decried as artificial, but he is even accused of spoiling every flower he touches. Fashion has been setting very strongly towards gardening, and yet the number of florists has by no means increased in the same ratio, the newer gardeners either grow things for their rarity or associations, alpines and the like, or else consider flowers as a means of getting certain color effects in their gardens rather than the garden as a means of growing flowers. But the florist's day is coming again; among the new recruits must be a certain proportion who will be drawn to the love and study of the flower itself, and it is out of this intimate affection that the true florist is begotten. The justification of the florist is that he has made himself so wholly acquainted with his flower that he sees its inherent possibilities and lays down rules and standards which are calculated to bring out to the fullest its natural capacities. The quaint irregularity, the careless grace of many a garden Tulip is full of charm and at first sight takes the eye more than the severe outline of the florist's type, but these are chance effects of the picturesque order, and if pursued do not lend themselves to the improvement of the race. The florist's work has consisted in taking certain qualities latent or dimly seen in the wild flower, such as symmetry, texture of petal, or marking, and raising these to the highest pitch of excellence. The Tulip fancier will tolerate no pointed petals because they interfere with the cupped shape, which is the only one compatible with a full display of the markings; he must have a clean white base to the cup because he thus gets a surpassing effect of contrast in his perfect flower. The rigidity of the florist in excluding backslidings from his ideal, fallings away to the right hand or the left, is because he realises that "the good is ever enemy to the best," the ideal may be unattainable, but he will make no terms with anything that is not on the road to the final goal. Of course, there are those who deny the whole idea of improvement, who prefer the clear frail beauty of the dog-rose in the hedge to the finest Marechal Niel that was ever staged; all the florist can answer is that if you begin by liking the wild Rose and growing it, you are pretty sure to pass onwards to the florist forms. The mind of the individual somehow follows the development of the race, and florist's flowers, with their apparently artificial rules and standards, are simply the outcome of the work of many generations of men and women who have loved them and thought over them. For these are flowers with a history, with a tradition of the grand style behind them; the Tulip, for instance, was already created, with all its properties and qualities, before it came to Europe from the East in the fifteenth century. In the hands of the Dutch and Flemish gardeners of the seventeenth and eighteenth centuries it moved steadily onwards, the conception we hold to-day getting more clearly defined with each generation, until the English growers of the nineteenth century formulated the requirements of the ideal flower, to which the actual has hardly yet reached. A few of the old Continental varieties are even yet hardly outclassed, but on the whole the Dutch growers remain where they were a century ago, the few novelties they have raised fail to satisfy the severer standard of the English fancy, even though that standard was originally laid down with some clearness in Holland.

Thus the "properties" of a florist's flower are by no means arbitrary and artificial, or conventions pure and simple; they represent the accumulated experience of generations, the opinions that have survived and proved permanent after innumerable trials and errors in all directions. It is not to be expected that even the perfected flower will appeal to the casual spectator all at once; severer beauties which depend upon form and style demand some training and study upon the part of the observer, if he is to discriminate and do more than merely enjoy the obvious. The visitor to a picture gallery appreciates in proportion as he knows; in his early days he is likely to be taken by the pictured anecdote, by the commonplace in some form or another; and the florist's is an art that has its kinship to the painter's.

But, as we said, a show is not the best place to enjoy the beauty even of a fancy Tulip, it should be seen on the bed with the morning sunshine through its petals—all gold and fire—opening wide to drink the "heavenly vintage." But the show is a necessity; without the stress of competition the flower moves but slowly along the path of improvement, and there is nothing like the stern ordeal of the green boards to create that divine discontent with what one has already accomplished, which in the end maketh all things new.

Florists' flowers are often "miffy" and uncertain, "bad doers" in garden slang, not because the florist likes them so, but because they possess qualities he cannot for the time being attain in the more vigorous varieties. Sooner or later a new break comes with the desired grace and strength and this is the ordinary gardener's opportunity. The mere garden lover is contemptuous of the florist, but he has in the end his profit out of him by taking his best, forgetful of and even ungrateful for the slow steps that have led to the glorious result. So the Royal Horticultural Society is acting wisely in extending its hospitality to these specialist shows. They may seem to appeal to but few, but they are in a way one of the creative factors in horticulture, and will eventually endow our gardens with still rarer beauties.

—Saturday Review.

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DAFFODILIA.

Which are the fairest flowers in the world? An unprofitable, an unanswerable question, surely, if there ever was one. Who is to ascend the seat of judgment and decide the matter for us? Shall we give ourselves into the hand of the naturalist, or the artist, or the poet, or the lover? Innumerable are the fancies that will cross one another and confound us beyond all hope of settlement, the moment we put to ourselves the problem. If we are wise, we shall cease vain comparisons, and go down on our knees, like Linnæus before the gorse, merely to thank God for all these marvellous works of His hand. The spring, the summer, the autumn, the winter come and go, each bringing us some timely blossom or berry, which, as we hold it in our hand and meditate on its exquisiteness, seems incomparable. "Omnia tempus habent," cries the preacher contemplating the vicissitudes and order of the world, "cuncta fecit bona in tempore suo"—"to everything there is a season," "He hath made everything beautiful in his time," and there is the conclusion of the matter.

But at the moment we are writing it is springtime, and in spring it goes hard indeed to deny supremacy to the Daffodil, the flower beloved of poets out of memory, that moved Herrick to his tenderest mood, whose "golden hosts" set Wordsworth's heart dancing with glee—the Daffodils, of which Shakespeare tells us in perhaps the loveliest flower passage of all English literature:

"That come before the swallow dares, and take
The winds of March with beauty."

The winter rigors have spent themselves, the birds have chosen their mates and are a-building, the very winds, even when they blow boisterously, have that ring of life and hope in them so different from the rage and sobbing gales of autumn; yes but the boughs are still bare, the earth is still barren, when these harbingers of Flora's pageant, "beneath the trees," or in the meadows,

"Continuous as the stars that shine
And twinkle on the milky way,"

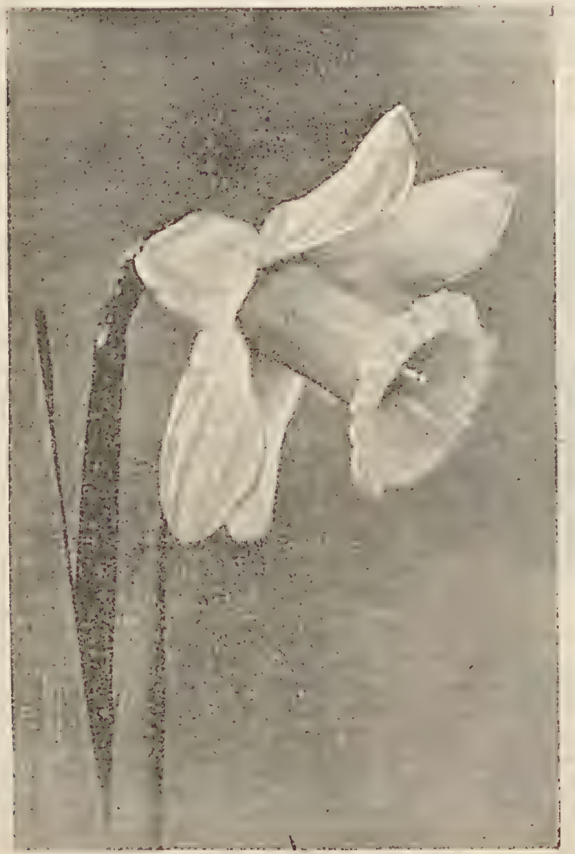
spring up to gladden us. These homely blossoms, were they indeed not one half as bright and dainty as they are, would perforce engage our affections, compel our praises, out of sheer gratitude. Lent lilies our forefathers called them, and appropriately enough; yet not assuredly as penitential flowers or for any touch of gloom about them, but rather as "annunciation" lilies, gay heralds of Easter, restorative blossoms instinct with the promise of resurrection, of renewed life and happiness, for nature and humanity. Let Wordsworth again interpret for us—

"A poet could not but be gay
In such a jocund company"

he cries. There are flowers which are for pensiveness and tears, for adieux and memory; but the Daffodil comes clad in the sun's own livery, bidding us lift up our heads and rejoice.

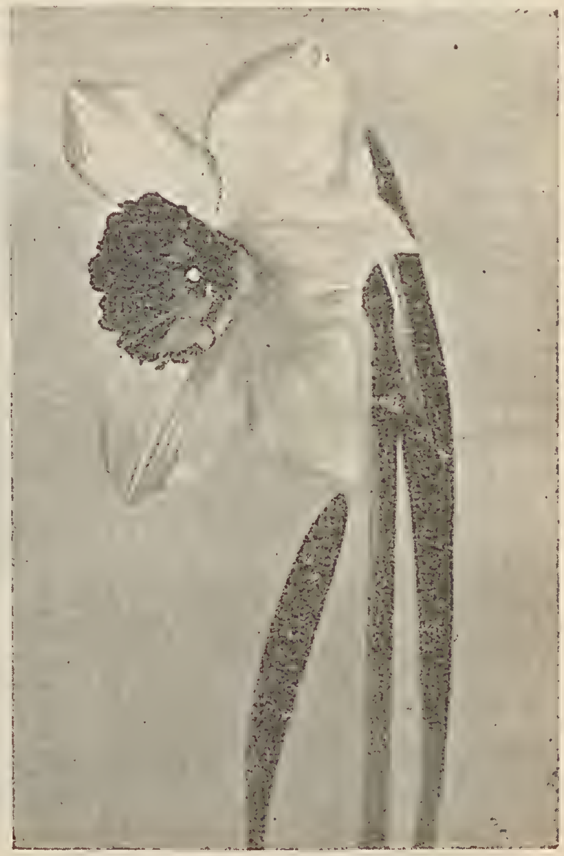
We have but just spoken of these golden creatures as "homely" blossoms, and some of our readers looking round on our nurseries and flower stalls may naturally start at the epithet, and say that it is surely the most inappropriate in the world. Well, for many a long day past, for fifty years or so, a man's art no doubt has concerned itself much with these blossoms, has wrought strange marvels with them, at last has set them incontestably amid the very aristocracy of flowers. Fifty years ago away in Yorkshire was Mr. Backhouse, in the south was Mr. Leeds, enamored of their beauty, prescient of their possibilities, patiently and unknown to one another with curious art raising strange new forms, large and splendid. Then into their labors, some three decades since, entered another enthusiast, Mr. Peter Barr, to carry on their work, to develop it to finer issues, to infect the world, if one may so say, with his own enthusiasm, and to ravish us amid his wide fields at Long Ditton with stretches of Daffodils and Narcissi year by year blossoming into fresh marvels of size and shape and color. We shall return to these developments directly; for the wonder and beauty of them are fresh in our memory, and we would have others share, if possible, in the delight they have given us. But what was the original stock that set Mr. Backhouse and Mr. Leeds on the work, with which for horticulturists their names are for ever so honorably associated? Granted that it is in Portugal and the borders of Spain that the most prolific natural home of the Daffodil must be located (if we except North Africa with its peculiar polyanthus or bunch-flowered form of the species, the Narcissus Tazetta), whence through Asia Minor into China this exquisite family has in the course of nature spread; granted this—yet what can we claim for our own land as indigenous, claim as the parents from which the earlier cultivators with patience and subtle art started on the work of development and variation, now grown to so marvellous a pitch? We, too, as well as Portugal or Africa, have our inheritance; for centuries in England her native Narcissi have quietly grown and been loved alike by poet and by peasant; have, too, if one may use the expression, played at art amongst themselves, showing us of their own accord without human interference what virtues and possibilities were latent in them. We are told by those learned in their natural history that England may boast three indigenous kinds of the great family of Narcissi, the pale, low-growing single Daffodil, the richer, more imposing double Daffodil and later in the springtime, in the "merry month of May," the true Narcissus (Narcissus poeticus), the very poet's Narcissus. But who that has sunned himself in an old English garden, a cottage garden it may be, and does not recall other Daffodils there, rich yellow Daffodils, and white ones stained at their heart with pale gold, and other white ones stained rich orange at their heart? And when he has asked the cottager the names of these, what delightful, simple, old-world, descriptive names he has had given him—"Butter and Eggs," "Codlins and Cream," "Eggs and Bacon!" Whence came these varieties, time out of mind the spring beauties of our old-world gardens? Ah! their lives no record of that. If we ask our botanist, he but shrugs his shoulders and replies, "Probably they were natural hybrids." It is a pretty belief, and at least no one can overthrow it; as we said a moment ago, here are these homely flowers of ours, the Poet's Narcissus and the Daffodils, playing at art with one another, and to such charming results!

But from the dim ages, when all that flourished in the land were Lent Lilies and the Poet's Daffodil, to this year of grace 1899—from the cottage gardens with their "Codlins and Cream" to that veritable Paradisus Narcissorum, Messrs. Barr's nurseries at Long Ditton, is a far cry. As the train runs out beyond Surbiton, the eyes of every traveller must have been caught and enchained by those stretches of white, and sulphur, and gold that cover the land on his left, now glistening in the sun, now subdued into a pearl and promise mist over the earth at twilight. Unsatisfied with a



NARCISSUS "MADAME DE GRAAFE."

This is one of the largest of White Trumpet Daffodils, and a flower of delicate beauty and good substance; we consider it ranks as The Queen of White Trumpet Daffodils, and for grace and elegance of form it is perhaps unsurpassed. The whole flower is of a soft pure white, but on first opening the trumpet has just a shade of soft pale primrose which adds to the charm of the flower. It is a strong grower and free bloomer, and equally suitable for pots or the open border, ht. 16 in. First-class Certificate R.H.S.—From Peter Barr's Catalogue.



NARCISSUS GLORIA MUNDI (Incomparabilis).

A glorious flower with fine bold clear rich yellow perianth, large cup much expanded and very heavily stained orange-scarlet, handsome and striking, extra fine, strong grower, ht. 18 in. Awarded first-class certificates R.H.S. and Midland Daffodil Society. This is w hou doubt the finest yellow Incomparabilis with stained cup yet raised it and is a noble flower either for the flower garden or for cutting.—From Peter Barr's Catalogue.

mere passing impression of all this beauty we alight and visit these fields, wander leisurely up and down them, contemplate one by one each bed in turn. For a while we are in confusion, and so undiscriminating. The general loveliness of the flowers needs, indeed, no practised eye; but it is here as always where art and science are concerned, the niceties of distinction, the pleasure, that comes to the connoisseur from his curious appreciation of these niceties, are not to be arrived at but gradually and with attention. As the connoisseur's sense steals over us, how alert grow our perceptions, into how charmed a circle we feel ourselves entering, full of strangely new interests and sensations! The very language of the scientist and his orderly divisions have something captivating about them; yielding to the spell, we would ourselves become students and cultivators. How superb are these bloomss of the large Barri conspicuus with its rich yellow perianth, and its yet richer cup deeply edged with orange; or the Stella superba, white and brilliant gold; or the Incomparabilis Gwyther, soft sulphur and chrome; or the splendid yellow of the clustered heads of Odorous rugulosus! Let us leave these Medio-coronati, these Star Narcissi, and turn to the true Trumpet Daffodils, the Magni-coronati, of which some more imposing, but certainly no lovelier, example may be found than N. Johnstoni, the Queen of Spain, the clear brilliant yellow hybrid from the exquisite little "Angels' Tears," this a natural hybrid, too, let us remark, one of Mr. Peter Barr's many discoveries on the borders of Spain. Or is it showier blooms we hanker after? Then, take the majestic flower appripriately enough styled "Emperor," or the Santa Maria noticeable amongst them all for its elegantly twisted perianth.

But space fails us to name even the best of this splendid company. Year follows year, and its numbers grow. But lately have been joined to it the large yet exquisitely delicate "Madame de Graaff," a very duchess in ivory satin tricked with pale gold; the brilliant yellow Gloria Mundi, its splendid chalice stained through to orange; and then, latest comer of all these, and to an initiate perhaps the most precious, the "Apricot," its long straight trumpet just the delicious hue of the fruit that names it—the crown this, assuredly, of how many years' patient labor and thought, the strain of red brought at last to mingle with the natural yellow, and lo! a new color springs to birth in this exhauslessly delightful Daffodil land.

Delightful indeed, for all its wealth of grace, and color, and form, and subtle fragrance; delightful, too, these Daffodils for their timely appearance on the earth, and finally, let us say, for their hardihood. They ask from us no fanciful nurture amidst strange heats and curious soils; they will flourish and blossom bravely under our northern, and too often reluctant, springs; nor in the open country only, but here even in our town dwellings they will consent to unfold their charms for us not grudgingly.

—Saturday Review.

THE PETUNIA AS A SUMMER FLOWER.

The usual fault of the spring flowering annuals is the short season of their bloom and the necessity of replacing or renewing them with fresh plants. The Petunia, on the contrary, can be planted in the early autumn for early spring flowering or in the spring, and it goes on cheerfully flowering the whole summer through, and if cut back pretty hard in the autumn it shoots out afresh, and is ready by spring for another year's blossoming.

Another good point in favor of the flower is its ease of culture. When once established a little hoeing and an occasional watering will suffice, and it fills the beds with bloom and the air with perfume.

For this climate it is undoubtedly one of the very best garden plants for all-round value. The seed requires care in raising, and it should be dropped on the surface of a well-prepared pan of soil, and only dusted over with fine soil. Watering must be very carefully done, as the seeds are so small, and are apt to be carried to the edge of the pot and not come up regularly where carelessly watered. The seedlings require pricking out into a box or other pans when they begin to crowd one another, and when about 3 in. across and five or six leaves are showing they may be put outside for bedding. It is well to keep back a supply of seedlings to fill gaps, as slugs are very fond of Petunias.

PETUNIA.

The best manure for them is well decayed stable litter. When used as a mulch and abundant water can be spared, extra fine blooms can be got of the different strains. The grandiflora, the fringe edge and the superbissima sections, are the most popular. Of these, the superbissimas have of late become the leaders, because of their great size and substance, their variety of color, and their fitness for exhibition purposes.

DEAN HOLE AND HIS ROSES.

The London correspondent of the Boston "Herald" is authority for the statement that the eminent England rosarian and divine, Rev. Dean Hole, adds 5,000 dol. a year to his income by the growing and sale of his Rose products, which are disposed of by a wholesale florist in Covent Garden market.

What puzzles most people, says the correspondent, is how the Dean persuades Roses to grow in a place like Rochester, as experts say that the flower never flourishes in a smoky atmosphere or in a chalky soil. It has been surmised that the kind old Dean's piety has much to do with the phenomenon, but the reverend gentleman denies the soft impeachment.

Like a good business man, he will not give his secret away, and merely says to searchers after knowledge: "I am eighty-three in the shade, and, although I have no desire to encourage gambling, I will back myself to grow a Rose with any man in the world."

ROSES ON THEIR OWN ROOTS.

Two good Roses which succeed splendidly grown on their own roots, though neither are, I believe, Teas, are Mrs. Bosanquet and Reve d'Or. I have never seen such a fine specimen of Mrs. Bosanquet as one I saw on its own roots. It was in a bed with several others, whose names I forget now. The natural soil being sand and gravel, this had been taken out to a depth of 10 ft., so I was told, and replaced by good loam and manure. All the Roses in the bed were on their own roots. The Reve d'Or was grown in quite a different climate and soil, and I do not know how the bed was prepared, but it was a splendid tree. It was in the centre of a round bed, about 3 or 4 ft. in diameter, and nearly filled it, and was full of flowers.—A. F. K. in "Gardener."

WHITE PINKS.

The white Pinks have been a grand feature this year in those gardens where generous space has been allowed them. One old garden I know has long straight paths edged with these sweet-scented old flowers. This means that their number runs into many hundreds, and the result is that every portion of the garden is filled with sweet scent.

There are a few points that should be remembered with regard to the culture of these flowers. One is that the plants will not last for ever. As they grow old they get unsightly and straggly, and some winter frost in all likelihood deals them a fatal blow To prevent bare spaces, it is advisable to put in a few cuttings in some spare border, to be transferred in Autumn to take the place of any plants that have the signs of age and decrepitude upon them. It is a good thing when putting out these new plants to add a certain proportion of new soil, as, like Carnations, Pinks generally get tired of the same soil year after year, and are finer and better in fresh positions. This change of position can scarcely be accomplished when the plants are used as permanent edgings, and therefore new soil and an occasional top dressing is the next best thing.

These Pinks make one of the most satisfactory of edgings—Silvery foliage for the early months, masses of sweet smelling flowers. A little work with the garden scissors to remove all the faded flowers, and behold again neat, silvery foliage for the remaining months in the year.—F. M. Wells, in "The Gardener."

Answers to Correspondents.

Unley.—To eradicate soursobs the only way is to dig them up. While digging obtain the assistance of a few strong chickens or fowls in a moveable coop placed upon the newly dug ground.

Codlin Moth.—The trees should be sprayed with Kedzie's mixture as soon as the petals begin to fall from the blooms. Then the secret of success is to keep the fruit covered with the spray.

Llewellyn.—The specimen forwarded is identified as an abnormal male growth.

Homeria.—The colour of the flower of the poisonous weed Homeria collina illustrated in our last issue is of a salmon tint, and the shape and size of the flower like that of the common garden Sparaxsis.

Edging.—One of the prettiest and gayest edgings can be made with Virginia Stocks. Seeds can be sown now, and the flowers will last a long time.

Dinner Table.—Try the effect of Nasturtiums for decorating. Few flowers compare with them for lightness, colour shading, and artistic effect.

Sweet Peas.—Sweet Peas are rarely grown in pots, but as a decorative pot plant they are really very effective. Plant the seeds in pots and let them grow outside until near blooming, and then remove them into the house or verandah.

Sandy.—To grow Roses in sandy soil dig holes at least two feet deep or more. Put in a thick layer of clay at the bottom, and fill up with good holding loam mixed with cowyard manure.

Rose Hedge.—We notice that for a rapid growing and pretty hedge of Roses the "Gardener" recommends Penzance Briers. Flora McIvor, white; Lord Penzance, fawn passing to yellow; Lady Penzance, copper; Jennie Deans, scarlet crimson.

Lawn.—Golden Lambert (Cupressus Lambertiana) makes one of the best ornamental tree centrepieees for a lawn.

Amateur.—Ringing Chrysanthemums we believe is in an experimental stage. We understand that a small incision is made round the main stem near the blooms when filling. The idea appears to be to prevent the sap from returning and increasing the size of the bloom.

Medals.—At the National Rose Society's Exhibition in Glasgow this year the gold medal for a seedling Rose went to Messrs. B. R. Cant and Sons, who named their new variety Blush Rambler. Other Roses specially mentioned were Mildred Grant, G. Piganeau, Mamie, Bessie Brown, Mrs. E. Mawley, and Niphetos. White Mamen Cochet was included in nearly every exhibit, and was specially mentioned.

Carnation.—Cuttings may be planted now. One of the many secrets in growing Carnations successfully is to make sure that your cuttings are from good strong parents.

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MRS. EDWARD MAWLEY.

This beautiful Rose, introduced by Messrs. Alexander Dickson & Sons in 1899, and named after the wife of the popular secretary of the N.R. Society, has quickly established itself as a great acquisition both as an exhibition and a garden Rose. The raisers speak of it as follows: Superb variety; it is a chaste and perfectly formed flower of marvellous beauty. The growth is vigorous and of branching habit, flowering with the greatest freedom throughout the entire season. The blooms are very large, of great substance, beautifully formed with high-pointed centre, from which the petals reflex; color bright carmine, shaded salmon, very sweetly scented. Awarded gold medal National Rose Society.

The Rev. Foster Melliar, M.A., in his "Book of the Rose," 1902 edition, says of it—"A new variety, but its reputation is already as one of the best cool season varieties we have. Taken all round, it is, I think, the best of the three very fine show Roses (Ulster H.P., Bessie Brown H.T. being the other two), which Messrs. Dickson issued together in 1899. Said to be a seedling from Mrs. W. J. Grant. It certainly shows a strong family likeness to that fine Rose, but is a better grower. Here there is one of those cases which might easily have been foreseen where it seems almost impossible to decide whether the Rose is a hybrid or pure tea. At any rate, it is an extremely good Rose, free in growth, very free blooming, and producing extra large, finely shaped flowers, even quite late in October. The shape of the blooms is quite first-class, color very good, and size magnificent. It does not show at its best in a very hot season, but even then it will come again very fine in the autumn.

MRS. EDWARD MAWLEY.

Best as a standard, and producing its finest blooms as a maiden, with grand wing petals and very sweetly scented. I have detected no bad habit, save some loss of color and stiffness of outer petals in very hot weather in this truly fine variety."

Referring to the reverend gentleman's criticism, Roses of this character do not stand our summer's heat, and are not seen to advantage unless we have a cool spring, but in autumn they are at their best, and some splendid blooms of Mrs. E. Mawley have been produced on the Adelaide plains during the past few months.

BAMBOOS.

Bamboos may be considered as indispensable as are Eulalias, Erianthus, and other ornamental grasses, and add a feature to our gardens and public parks comparatively unknown. They may be planted as isolated clumps, or for screens for hiding objectionable objects, and as there are giants and pigmies among them, the latter will be found of great value under dense shade where other grasses or similar plants will not grow. They are indispensable as decorative plants, grown in large pots, or tubs, and are a grand addition to the list of plants suitable for halls, such as bay trees and evergreens, possessing a gracefulness and elegance unequalled by such plants.

The best season for planting our Bamboos is undoubtedly in spring, and clumps from near-by nurseries may be used. But pot-grown plants are to be preferred; these are worth considerably more, not only on account of the time taken to grow them in pots, but because the plant and all the roots are intact and are not mutilated in removal or transplanting, and the plant is not subjected to a check, which in the open ground it invariably is, as it naturally sends out many rhizomes in all directions. Bamboos require a rich, mellow soil and sandy rather than a stiff loam or clay. They delight in abundance of water, but are not bog plants. They must not stand in water. If the ground is heavy, ample drainage should be provided, so that water will not stand around them in winter.

Although several varieties of Bamboo have wintered in this section without any protection whatever, it would be well to select a somewhat sheltered spot that would temper our prevailing nor'-westerly winds in winter. The moist easterly winds do not affect them. Bearing in mind the Islands of Japan and the coast of China are often swept with fierce storms, it would suggest that the Bamboo will prove of great value near the seacoast where the winters are not extremely severe.

No better place can be found for planting Bamboos than by the side of a stream or the margin of a pond, and, although some advocate a rockery, I for one would say don't. The plants spread in all directions; there is nothing to hinder them, and in a short time you may find that you have nothing on the rockery but Bamboos, especially if the dwarf varieties are planted.

As to protection, I would advise, in sections where the thermometer falls below zero, a good mulching of leaves with branches of spruce or other trees stuck in the ground to keep the leaves from blowing away, also to mulch newly planted stock.

The following Bamboos are perfectly hardy in the vicinity of Philadelphia: B. aurea, B. Metake, B. mitis, B. nana, B. nigra, B. nigro-punctata, B. Quilioi, B. Simoni, B. viminalis, B. viridi-glaucescens, B. pygmea, B. Fortunei variegata, B. Simoni var. striata, B. Boryana. Most delicate kinds are: B. falcata or scriptoria and B. Castillonis, but they are not hardy. Grown as specimen plants in tubs for decoration they are, however, most desirable B. palmata and B. tessellata are handsome plants, possessing the largest leaves of any, and are said to be hardy; but stock has been limited; and it was deemed prudent not to venture it out over winter as yet.

In connection with the foregoing I may add that B. Simoni flowered and produced seed very freely this spring. A quantity of seed was gathered, but a large lot dropped on the ground. This, without hardening up, germinated in a few days, and a crop of young seedlings is coming along very satisfactorily. This is the first time I have known any Bamboo to perfect seed in this section of the country.—Wm. Tricker in "Florists' Exchange."

You can have "The Australian Gardener" posted to you for 12 months for 3s. 6d.

The Orchard.

OPERATIONS FOR OCTOBER.

RINGING THE CURRANT VINE.

TO THE EDITOR.

Sir—Better late than never. So far back as December last year a letter appeared in that interesting issue of your paper, with the above heading, and signed "Nature." Intending to respond to your invitation for the views of other growers, I have constantly kept that issue at hand. I am afraid I am not witty enough to give a brief reply to the ludicrous but somewhat gruesome charge made by "Nature" against the evils resulting from the use of currants from cinctured vines; instead of which I send you a sample of my currants, which are the production of vines so treated. If you requisition the services of a kind lady friend to prepare some article of confectionery in which currants form a prominent element, your own opinion of the comparative merits of the fruit from cinctured and uncinctured vines will be better than any assertion of mine, and I hope none of the evils which "Nature" so graphically describes will follow. These currants had not the advantage of the stemmer and grader, but are taken from a bag kept for home use, large and small mixed. I think you will find the very small berries somewhat conspicuous by their absence.

It is quite certain that the "ringing" of the vine does greatly assist in setting the fruit. I have been trying a series of experiments on the Zante currant vine for the last twelve years, in which I have practised the various plans for topping, girdling with wire, thread, &c., from all of which "dodges" increased crops have been obtained. I have also tried partial cincturing with more or less success; but the complete cincturing has produced an increase, and certainly which I have every reason to conclude is quite unequalled by any other method. I hope to write an article on the "Philosophy of Cincturing" before that operation again becomes desirable. I may say that my first experiments in cincturing date back more than forty years. Horticultural matters have been my hobby and recreation since my boyhood. I hope to be able to present a theory which will tend to explain the reasons of the effects produced by judicious cincturing and the very different modes of procedure with vines and most other fruit trees.

I am of opinion that the notion of the currants from cinctured vines possessing less sugar and flavor than from uncinctured vines arises from the fact that the former, attaining a greater size, are longer coming to perfect maturity, and it is too generally the practice to gather the fruit as soon as it is colored, which is a grave mistake. The fruit being more perfectly set, is not so liable to drop from the vine as in the case of uncinctured vines. I am also strongly of opinion that the notion of cincturing greatly affecting the life and vigor of the vine is altogether founded on a fallacy. Cincturing causes every bunch to set, and there is great danger of the vine suffering from over-bearing, which can be effectually prevented by hard pruning.

I send by this mail a copy of my last literary work before retiring from public life. Possibly you may find some items in it which may be useful in giving answers to correspondents, regretting that my health has not allowed me to deal more fully and concisely with the important subject of the currant industry,

I was greatly interested in Mr. F. C. Smith's letter on the Gladiolus. I may, at some future time be able to give you the results of my experiments in improving this beautiful flower. I think no climate or soil in the world can be more favorable than that of South Australia. There seems to be no limit to the possible improvement of the Gladiolus. My experiments have been entirely with the Gandavensis type, and with which I have had great success.

I am, Sir, &c.,
W. H. HARRISON.

[We were very pleased to receive this letter from such an experienced and well-informed gentleman on the subject of cincturing vines, and also his sample of currants, which our chef pronounced very fair, and no evil results have as yet been traced to them. We have also to acknowledge with thanks from the author, Mr. W. H. Harrison, M.A., Shrewsbury, his book upon "Strawberries," which is a most useful work of reference. The letter having arrived in time, we were able to refer its contents to "Nature," the writer of the article upon which Mr. Harrison comments, and publish his reply. We shall be very pleased to hear again from Mr. Harrison upon any subject of interest to our readers.—Ed.]

TO THE EDITOR.

Sir—I have read Mr. W. H. Harrison's letter giving his experience and commenting on my letter in reference to above subject, and it gives me pleasure to reply to an old English enthusiast in horticultural matters. I quite believe he has obtained the results he mentions in his experiments, and increase of crop, but the quality is not the same from these cinctured vines, although it would vary. For instance, in very old vines the difference would not be so much. In gardening, as Dean Hole says, "it all depends." The object to be obtained is to grow the vines to obtain the heaviest crop and finest quality without ringing. It is only a device to get a crop from old worn-out vines, or perhaps on poor soil, bad subsoil, or twenty other reasons not conducive to good health, which a professional man could soon find out. As a proof, in a letter in reply to Mr. Hardy, the writer said his crop was 4 tons to the acre without ringing. Land properly prepared for vines, good cultivation, and overhead trellis, you will not need to ring. Mr. Harrison refers to the size of the berry. The larger used to be sought after by buyers, but now, I believe, the smaller sugary berry the most valuable; in fact, the price varies so, and quality also, that they are sold retail at from 4d. to 9d. a lb., which shows there is something wrong. The large berry, overcharged with sap, shrivelled up in drying till there is nothing much left but skin, is the worst. My only object in writing on this subject is that I think it's a bad makeshift to advise young Australia. We want quality to beat the imported both here and in England, and can do that easily with good cultivation and our climate.

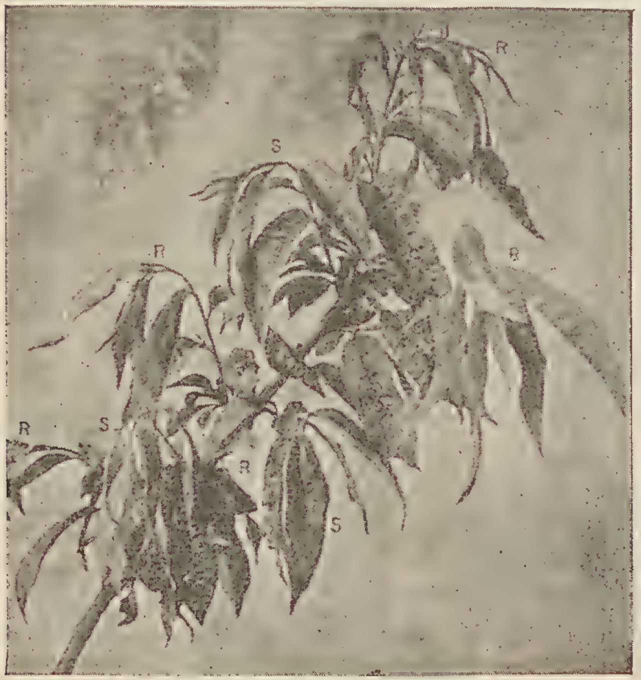
Re Mr. Harrison's pamphlet on "Strawberries," published at Shrewsbury, a very nicely written work for amateurs. There is a great deal to learn to grow strawberries to perfection; in fact, more so than fruit-trees. "It all depends" on soil and situation, requiring quite different treatment.

I am, Sir, &c.,
NATURE.

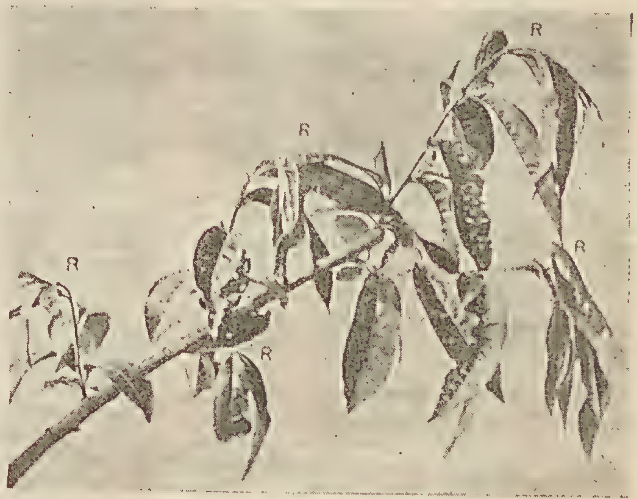
ORCHARD NOTES FOR OCTOBER.

By Geo. Quinn.

[Journal of Agriculture.]



PEACH BRANCH—NATURAL GROWTH.



THE SAME BRANCH DISBUDDED.

In pretty well all parts of the State the surface of the soil which has remained roughly dug or ploughed should now be broken down with the cultivator into a fine tilth. The finer the particles composing this tilth the more will the loss of moisture be stayed; the more crusty or cloddy it is allowed to remain, the more rapidly will the moisture pass from the subsoil into the air. Experimental tests have shown that if this stirred layer of pulverised soil be made 4 or 5 in. in depth the check to evaporation is increased. There is no side of orchard work demands more attention than this subject of conservation of soil moisture. If, by exercising the means indicated above, we store up all the available rainfall during winter and do all our knowledge can suggest to arrest its escape as the warm days of spring and summer come around, we must secure the greatest benefit to our trees from the possibilities at hand. A supply of moisture, which is constantly retarded as it rises to the rooting area, will yield a natural and regular supply to the tree, and permit a stead progressive movement throughout its organs. It also tends to keep the roots down in a layer of soil where more equable conditions prevail. Its action is continuous, and not spasmodic, and in this it differs from any supply of moisture applied by surface irrigation during the season of enormous evaporation which marks our summer months here. It also possesses the advantage of maintaining a much more desirable texture in the soil as far as its physical characteristics are concerned. The implements used in keeping this mulch intact and loose should not turn or ridge the surface. Although it is desirable to retain a flat surface exposed to the air, the under surface of this mulch should be as irregular as it is possible to make it. The use of a harrow or cultivator, whose teeth travel to an even depth through the soil, tends to form a flat, hard subsurface—a temporary "hard pan"—which may become permanent unless the succeeding winter cultivation be deep and thorough. Flat-soled tines will produce this effect very quickly, and are now being discarded by many orchardists.

As the young growths upon newly planted trees lengthen out, careful attention to disbudding will prove useful in shaping the body. A good rank growth is desirable on all such trees, as every leaf indicates increased health and strength. The absolute suppression of shoots is scarcely desirable at this period, when we are anxious to re-establish the balance which prevailed before the tree was removed from the nursery. Unless they are very crowded together the shoots not desired in framing the arms of the tree should therefore only have their terminal sappy points pinched out. This will give a temporary check to them, and allow those more desirable to get a good lead. As often as these undesirable branches appear to menace the supremacy of those selected to form the tree, they should be pinched in this manner. At the succeeding winter's pruning these may be entirely removed or treated to turn them into fruiting wood. As there has been much severe pruning done among trees of a mature age during the past winter, strong growth must follow as a matter of course. If time can be spared to go through and pinch back those best situated, and carefully rub out the surplus shoots while they are yet sappy, the energies of the tree may be directed into useful limbs, and much winter pruning avoided. Unless these lopped trees are carefully thinned during the next season or two their future condition will be worse than the past. Much "pitted" fruit may be expected upon apple trees where the varieties subject to this disease have been heroically pruned.

The novice need not hesitate to transplant citrus trees, passion fruit vines, or guavas at present, providing general care is observed. In connection with the citrus trees the young sappy shoots should be pinched or cut off before the trees are lifted. The intimate connection between these extremities of the top and the feeding outside fringe of the roots which will be broken in the shifting, renders their removal imperative. To ensure success the top should be cut back in proportion to the loss of roots. This loss is not to be gauged by the actual quantity cut away, but the condition of those remaining should be fully considered. Even though the soil be rich the planter will find much to be gained by spreading some thoroughly decayed farmyard manure around the roots. If this is not available a slight sprinkling of sulphate of ammonia—2 or 3 oz. mixed in with the finely broken soil which will be placed around the roots—will prove a fairly good substitute. The organic manure is preferable on account of its moisture-holding character. All trees should receive a good watering immediately on being set out, and as soon as the soil is dry enough to be worked the watering trench should be forked up and the dry soil spread in again in a finely pulverised condition.

It is a good time to bud over large citrus trees that have proved unprofitable. In California much success has followed this work when done on a large scale. The practice adopted there has been to insert the buds into the main arms near to their junctions with the stem. The buds are put in in spring. They are not pushed down into the matrix made in the bark, as is done in ordinary budding, but are pushed up into a matrix made by making the T-shaped cut upside down. The wounds and buds are covered with waxed bands, such as we adopt in grafting. After the buds "take" the tops of the limbs are removed. Sometimes this is done at once, and the trunks and stumps are whitewashed against sunscald. Others prefer removing the tops gradually. The buds are taken from rounded shoots, and triangular wood or thorny buds avoided.

In late districts grafting will be carried out by ordinary methods, where scions are procurable. Bark-grafting is usually the most successful method to follow at this somewhat late period. Although not generally practised, there is no reason why, with the exercise of proper care, woody scions should not be cut and inserted during the growing season, as buds are cut and inserted. The drawback to bark-grafting is the ease with which the growing scions are broken off during the first two or three years. This difficulty may be overcome by fastening a stake to the old stock, so that it stands up against and parallel to the scion. To this the growing scion is tied securely, and should be kept tied for two or three seasons. A good secondary help is found in pinching out the growing points of the shoots on the scion from time to time. This gives a temporary check, and increases the robust character of the growth. If not done the shoots grow top heavy and sway about, thus increasing the danger of dislocation. In the case of large stocks, a good number of the shoots arising therefrom should be retained for a season or two. They will shelter the stem from the sun, assist in an equal diffusion of sap, and thus keep all parts alive and healthy. They also assist in the vegetable functions of the tree, enabling the top to utilise the large root system and keep it alive and active. If they tend to overreach or outgrow the scions, then judicious pinching should be reverted to from time to time. The healing over of wounds upon the stock is most important, and they should be dressed annually with paint or wax to keep out decay until the growing callus envelops them.

The spring season starts many garden pests into activity. Until the dry, settled, hot weather sets in the black aphis of the peach will be likely to cause trouble. These insects are very troublesome owing to their rapid breeding habits, and to the difficulty of bringing any spray into direct contact with their bodies after the leaves afford them shelter. There are several well-tried spray washes, viz., kerosine emulsion, resin wash, and tobacco and soap wash being most generally used. Of these I prefer the latter, as the materials are obtainable anywhere, and the method of manufacture simple and rapid. An ordinary stick of strong black tobacco and about double its weight of common soap will make a kerosine bucketful (four gallons) of very effective wash, if boiled together in the usual way. This kills by contact only, and must be thrown upon the insects. Either of these washes will kill, but the secret of success lies in several sprayings being given in quick succession.

The black and red scales of the citrus trees will start into active operations. The former frequents the midribs of the leaves to a great extent when in the flat reddish-brown stage, and as a rule their presence is indicated by the sooty appearance of the foliage or by numerous ants crawling about the tree stem. The resin wash or kerosine emulsion will kill these young black scales very quickly, and the soot will peel off naturally in time. These black scales and the olive green aphides are often responsible for the curling disfigured leaves found upon the orange trees, and they often absorb the nourishment from the young tips, which should go to develop the flowers for the coming season's crop. The red scale is more difficult to destroy, and if resin wash be used as a spray better results are likely to be obtained at a later date, when the insects are more generally on the move. No doubt in the course of time the fumigation tent and the fumes of cyanide or some other deadly gas will replace these washes in the destroying of all suctorial insects that attach themselves to the trees. It is far more thorough in its action, but at present the outlay for tents, &c., debars many from adopting these means.

In wet localities, or should the spring prove showery, the apple, pear, and apricot fruits will be kept much cleaner from fungus "scabs" if a second application of Bordeaux mixture be made. The strength should be weaker than that used when the trees are devoid of leaves. It is also of greater importance to use only perfectly fresh quicklime at this stage, otherwise the leaves will be burnt and the fruits "rusted." A strength of 1 lb. of bluestone and 1 lb. of fresh lime to each 10 gallons of water will not do injury to the foliage if these precautions are taken.

There is great promise of a general trial being given to the arsenite of soda spray for the destruction of codlin moth during the coming season. No time should be lost in removing and cleansing old bands and scraping off rough bark, cutting off projections from broken limbs, and other winter refuges for injurious insects. The fruit store should also continue to receive attention in the direction of securing the moths before they escape into the open. The general lowering of the height of the trees, which has been undertaken almost throughout the State during the past winter, is a very important step in the direction of controlling this pest. With trees of a manageable height, by means of spraying, bandaging, and picking infected fruits as far as practicable early in the season, there is much hope, that, favorable as the climate may be to its propagation, this pest will cease to be the bugbear which has filled our apple-growers with apprehension for years past.

THE CODLIN MOTH.

We have received from the Department of Agriculture a pamphlet containing the results of experimental spraying for codlin moth with arsenite of soda, compiled by the horticultural instructor, Mr. George Quinn, for the season 1902. This is a most valuable work for orchardists, and will amply repay careful study. The reports show conclusively that the moth need not now be regarded as an uncontrollable pest, provided growers will exercise some diligence and care in spraying their trees. The statistics go to show that by persistent work with the sprayer at least 95 per cent. of fruit can be saved at a cost that will be repaid in actual results of fruit saved.

We append particulars of the mixture and the times of application.

The solution of Kedzie's arsenite of soda supplied is to be used at the rate of 1 pint in 40 gallons of lime water.

The following method of compounding the spray is recommended: Take not less than 4 lb.—a little more is desirable on account of waste—of lumpy quicklime, quite fresh, and newly burnt, and slake it slowly by adding small quantities of water from time until the lime crumbles to powder and yields up its heat. Then thin down with clean water and strain out the sediment by passing the liquid through a bag or other close strainer. The pint of arsenite of soda should then be stirred into this strong milk of lime. After a short time the lime and arsenic mixture may be poured into the body of clean water which is required to make up the 40 gallons of spray wash.

Where it is desirable to combine Bordeaux mixture with this spray the arsenite of soda should be prepared in milk of lime as outlined above, and then mixed with the diluted Bordeaux instead of clean water to make up the required volume of spray wash, as follows: Suspend 4 lb. of bluestone just beneath the surface of 10 gallons of water in a wooden tub or barrel overnight, and in the morning it will be in solution. Slake 4 lb. of fresh lime, thin and strain as described above, and then dilute it to 10 gallons with clean water. Into another lot of strong lime water, made by slaking and straining 4 lb. of fresh lime, pour 1 pint of the arsenite of soda. The 10 gallons of lime water and the 10 gallons of bluestone water are now mixed together, and the lime water containing the pint of arsenite is poured into this in turn. Enough clean water to make up the 40 gallons of spray is then added. This wash would then contain equal to 8 lb. of lime, 4 lb. of bluestone, 1 pint of arsenite, and 40 gallons of water. Freshly burnt lumpy quicklime is absolutely essential to avoid burning the foliage and fruits, and a little excess of fresh lime will do no harm, while a much larger quantity of stale lime will not act as a substitute for the quantities of fresh lime given herein. The arsenite of soda, as supplied in the tins, will destroy vegetation, and to change it into arsenite of lime, which will not injure the trees, fresh lime is essential.

The first spraying should be given as soon as the young fruits are formed, and the second about nine days later. In these two operations the spray should be driven into the calyx cups of each fruit. The third spraying should be applied fourteen days later than the second. The fourth should follow twenty-one days later, and the fifth at a similar interval after the fourth. The object of the operator should be to keep the fruits coated all over with the spray.

LIFE HISTORY.

In early summer, when the young apple is just set, the moths, which have passed the winter either as larvæ or pupæ, emerge from their confinement, pair, and within forty-eight hours the females fly from apple to apple, depositing an egg in each until they have exhausted their stock.

In from seven to ten days the larva is hatched, when it commences at once to gnaw a hole and bury itself in the substance of the fruit, making a burrow obliquely downwards so as to avoid the core. At this stage it is hardly visible to the naked eye. When six days old it measures nearly one-quarter of an inch, and is about as thick as a fine silk thread. In ten days by the time it has burrowed about it is about three-eights of an inch long, and three-fourths of the distance to the core, its presence may be detected by the brown powder it throws out of its burrow. The body of the young caterpillar is of a whitish color, and it has a black head. The next segment or collar, as also the end segment, are darker in color. It has eight little black dots or warts on each segment, so arranged as to make two rows down the back and one row on each side. From each dot proceeds a very fine white hair or bristle. The dots and hairs are only to be clearly seen with a magnifying glass. It has three pairs of true legs (legs with claws situated near the head), four pair of ventral prolegs (legs without claws in the centre of the body), and one pair of prolegs at the anal extremity. This arrangement of legs is common to a great many kinds of caterpillars, and the dots or warts are not peculiar to the larva of the codlin moth, as the caterpillar which attacks the pepper-tree, as well as several other kinds of larvæ, have them; but if a caterpillar is found inside an apple or pear having the foregoing as well as other characteristics about to be described, it may safely be concluded that it is the larva of the codlin moth. As the larva grows towards maturity, which it attains in about twenty days, the body becomes more or less of a pink or flesh color, the dots nearly or quite disappear, and the head, collar, and anal segment become lighter in color. In about thirty days' time the larva is prepared to leave the fruit. According to Californian authorities, it then gnaws a hole through the apple, from which it lowers itself down by means of a silken thread, either to the ground or to an intervening branch. English authorities state that when about half-grown it gnaws a hole to the outside for the purpose of better expelling the pellets of excrement; it then returns toward the centre of the apple, when it feeds at its ease. When within a few days of being full fed it enters the core and eats only the pips, which causes the apple to fall.

Vegetable Garden.

OPERATIONS FOR OCTOBER.

By Geo. Quinn.

[Journal of Agriculture.]

On the open plains country the attention of the vegetable grower is now turned to the sowing and planting of summer crops. In the deep gullies of the hills the soil is only sufficiently dry and warm to permit planting similar vegetables to those grown on the plains during the winter and early spring. Without appliances, such as glass frames, or other warmth-collecting structures, being placed around each plant, it is little use sowing or planting melons until the temperature of the soil begins to rise to an appreciable degree. Melons thrive best in soils rich in thoroughly decomposed organic matter. A good compost for them is made by throwing all kinds of vegetable substances, such as weeds and grass clippings, mixed with droppings from animals, into a pit and allowing the mixture to decay for a season until it will cut out black and firm. Failing this, well rotted farmyard manure should be secured. Melons sometimes prove profitable on lands from which a crop of some kind has been taken, which received a heavy dressing of manure at its planting time. There are two methods commonly adopted in preparing ground for melons. One consists of digging holes into the soil of which the compost or manure is worked. The second consists of spreading the manure in strips 5 or 6 ft. wide and digging or ploughing it into the ground. The seeds are then sown in the holes or in drills along the strips which received the dressing of manure. The latter method would appear to meet the rambling habits of the roots, because they spread almost as widely as the creeping stems above ground. Three or four seeds should be placed in each spot, and these may be from 3 to 6 ft. apart according to the trailing habit of the variety. As soon as the seeds are sown they should be covered with broken decayed manure or sand, and the surrounding surface made loose and fine.

Edible podded beans—commonly called French beans—should be sown now. These like a well-prepared loam formed of a fair mixture of sand, clay, and organic matter, with a fair proportion of lime included. If the soil has become dry, give it a good soaking several days before digging it. Sow in drills say 1 ft. apart, with the seeds dropped from 2 to 6 in. apart, just according to the germinating power of the seeds. If a large area is to be sown it may be worth while taking a couple of dozen seeds indiscriminately from the stock, soaking them for several hours in water which was pretty hot when poured over them, and then placing the seeds between the folds of a bit of damp blanket in a warm room to germinate. It may be necessary to damp the blanket each day. By this test much disappointment may be avoided if the seeds are of unknown age. The whole of the seeds may be soaked if a rapid germination is desired. In such a case they should be allowed to stand for an hour or two after the water is poured off. This allows the testa or skin to toughen slightly, and without such a precaution the seedlobes may break asunder while being handled from seed vessel to the soil. Before sowing the seeds sprinkle a little superphosphate in the drill to help the plants later on. The seeds should be covered with some loose compost—a mixture of fine manure and sand is good—to a depth of about an inch. If the soil is fairly moist no water should be applied until the plants appear above the surface.

Among the dwarf kinds suited to the open dry country the Canadian Wonder is still a favorite. It gives a good pod, but takes a long time to come into bloom. The Emperor William and Dwarf Caseknife are more rapid. It is a good plan to sow a few rows of each kind at the same operation, as they will then come on in fair rotation.

Although tomatoes may be sown in the open ground, such a practice is not advisable excepting late in the season. The young plants when set out should be sheltered from the cold winds. A very ingenious shelter is made by cutting a kerosine tin into two parts in a diagonal direction and lengthways, leaving the square top of the tin on one piece and the bottom attached to the other. In the angle a stake is nailed which projects below the open end or bottom of the tin. This projecting stake is forced into the ground and the tin forms a shelter wall on two sides and on top. The stake is pulled up gradually as the growing top of the plant rises under the tin. Tomatoes do not prove profitable if grown in soils very rich in organic matter. A moderate quantity is valuable, but much increases the vegetative portions of the plant to the detriment of fruit setting. Potash and phosphates are valuable, and these may be given in the forms of superphosphates, wood ashes, or muriate of potash.

In small gardens in hot, dry localities, where water is available for irrigating, silver beet may be grown throughout the summer. It is a good substitute for spinach or cabbage, and will thrive at a time of the year when these cannot be produced in an ordinary garden. Sow the seeds in drills, enriching the soil with organic manures. The red beet is also a good summer vegetable, and may be produced in most gardens throughout the year by making sowings in selected spots. The turnip-rooted varieties give the best results in the hot months, as they grow into a useful size more rapidly than the longer and deeper-rooted kinds. These like a loose soil which has been dressed heavily with farmyard manure the season before. Fresh manure causes them to send out too many secondary roots.

Growing crops of potatoes should be hilled up, or the soil loosened between the rows. The surface of the soil between all growing crops should be forked or hoed up as much as practicable to kill weeds and conserve moisture.

Watch all tomatoes and melons growing under shelter for the appearance of aphides. Curled leaves usually indicate their presence. If found, spray the under-sides with weak soap and tobacco wash, and give fresh air and encouragement to the plants to make good growth.

Look to the saving of seeds from cabbage and cauliflower plants.

Do not be too hard on asparagus beds unless the plants are exceptionally strong. A good dressing of superphosphate and kainit, covered by a mulch of decayed farmyard manure will help the plants to make a strong recovery after the cutting season.

Rhubarb plants would be much strengthened by the addition to the soil of a good dressing of superphosphate, combined with a little sulphate of ammonia, more particularly if in dry places these can be washed well into the ground by irrigation. A top-dressing of rotted stable manure will also prove very valuable under such conditions.

ENGLISH ROSE CHAT.

Before this short paper is in print the battle of Roses will be over. There may be a few skirmishes here and there, but the great pitched battles have all been decided, and though many a young soldier in the Rose world has given promise that the battalions of the army will be efficiently officered when its great generals have retired from the fight, yet both with professionals and amateurs the leaders of the past few years still mark themselves as pre-eminently fitted for the position they have so long and honorably held. Now and again fortunes may vary. Climatic influences may differ locally so as to cause pre-eminent success or very partial failure, but the fact stands forth undeniable and undenied that the prestige of the giants of the Rose world remains unassailed.

After all, the Rose season is, to the thinking man, a parable. It is a diminutive picture of human life. It has its joys and its griefs, its failures and successes; it carries with it the lesson that is thousands of years old, "Nil sine labore," and it has the infinite blessing that every one who strives to do his duty enjoys a consciousness—a happy consciousness—that sometimes failure is better than success. While the idle or indifferent sit down and yield to difficulties, the hopeful and trustful rosarian works on, brave under reverses and modest under success.

Well, the Rose season has eventuated much, as I thought it would, though in many cases I have been agreeably surprised. With me it has been a year of light Roses, the dark ones have, as a rule, been inferior. The early growth was weak, and the blooms in consequence lacked substance. Here and there have been happy exceptions. Fisher Holmes has quite held its own. Captain Hayward, most beautiful but too ephemeral—the intense heat of the first fortnight in July was too much for this lovely Rose. Alfred Colomb and Marie Baumann, after the early shows, have been quite up to their usual standard, and Ulrich Brunner—never failing—has given most useful blooms. Duchess of Bedford, again, very much backward at first, has developed a few lovely flowers. But here, so far as dark Roses are concerned, my good news almost ends. When one comes to the lighter varieties the tale is different. Marie Finger has been superb. Margaret Dickson, Clio, and Mrs. Laing have delighted me. Mrs. Cocker has been excellent, and Her Majesty of better shape than usual with me. As I anticipated somewhat early this season, the Hybrid Teas (whose appellation is still a mystery to me) have been charming. La France, very good; Killarney, perfectly bewitching; Madame Cadeau-Ramey, excellent; Mamie, of good form, color, and substance; Viscountess Folkestone, charming; Caroline Testout, very good; Mildred Grant, not so good, but fair—this Rose is apt to come coarse with me when it has size; Bessie Brown, at times very lovely; and Edith D'Ombrain, most promising. I think very highly of this Rose, and I believe it will be well worthy of its name, and I do not think a higher compliment can be paid it. Teas have been quite good of late, notably the never-failing Maman Cochet. Madame Hoste, Medea, Rubens, Cleopatra, Anna Olivier Madame Bravy, The Bride, Muriel Grahame, Innocente Pirola, and Souvenir de S. A. Prince have been especially good. Sylph, too often imperfect, has given me many pretty blooms. While speaking of Hybrid Teas, I forgot to mention Clara Watson, and while thanking the Rev. David R. Williamson for his too courteous remarks, I am happy to endorse his opinion of this variety. It is an excellent flower, and I was pleased to see it in, I think, Messrs. Harkness & Co.'s prize seventy-two at the Temple Gardens.

As a little boy will pick out of his cake a few of the finest plums for a "bonne bouche," I reserve Frau Karl Druschki for this final post of honor. This is a superb Rose, having every quality that the queen of flowers should possess. It is a most vigorous grower and abundant bloomer, and its flowers are of excellent quality and shape, and in its color it stands alone. What is its parentage I saw some grafted plants of this Rose in Mr. Mount's home on July 3. They were grafted in January, and had some 8 ft. of growth on single stems, and as far as I can judge the vigor of this Rose in the open will be equal to that of any H.P. in existence. Papa Lambert ought to be decorated for giving to the Rose world such a magnificent variety. Readers will have had enough of me by this time, so I will close for the present.

Henry B. Biron—The Gardener,

POLYANTHUS PRIMROSES.

Polyanthus Primroses is a convenient designation applied to a race of handsome Primroses, the first blooms of which are of the true Primrose type; that is, one flower is borne upon a stem 3 or 4 in. or so in length, followed by Polyanthus stems, generally stout and erect, and bearing large trusses of fine blooms on short pedicels. Seeing that these two characters—the Primrose character and the Polyanthus character—are combined in the same individual, we are bound to recognise the fact that the Primrose and the Polyanthus are but two forms of the same species, and not two distinct species. I think we may assume that the Primrose was the original type, and that the Polyanthus has been derived from it. That the two are as intimately related as the Peach and Nectarine, which are simply forms of the same fruit, is seen in the fact that the common yellow Primrose of the fields, if subjected to good cultivation in gardens, will produce Polyanthus stems.

The Polyanthus Primrose makes a very effective and delightful spring blooming plant. To secure strong plants, it is well to sow seeds in pots or boxes of a good sandy compost which is well drained. I find germination hastened, first by sowing thinly, and second by placing a piece of glass over the box or pots in which the seed is sown, care being exercised to keep the surface nicely moist. As a matter of course, with a glass covering evaporation is slow, and very little water is really required. When the plants have developed their second or third pair of leaves they should be pricked off into other boxes or pots, be kept in a cool, shady place for a time, and then, when they show signs of growth, the pans can be stood out in the open, though not in the full glare of the sun in the hottest part of the day. That they must have necessary water goes without saying.

R. Dean—The Gardener.

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The Flower Garden

OPERATIONS FOR NOVEMBER.

There are two factors in gardening during November that require more attention and consideration perhaps than most of the many other features of work. They are soil and water. This month really introduces us to summer, and the temperature is possessed of many vagaries and changes. These changes upset the best calculations in outdoor work, and worry most gardeners into the feeling that there are other occupations which bring fewer grey hairs than gardening. We have not, however, to deal with those elements that are beyond the control of human beings. Gardeners have plenty to occupy their attention with things immediately under their control, and if a blasting east wind comes along and withers up their choicest blooms for show and other purposes, the philosophy of a good temper and renewed energy is worth cultivating. Whether the east winds come or stay away is not the first consideration, but preparation of soil to combat the heat of summer. It must be remembered that evaporation of water is very largely the cause of dryness, and is caused by the plants through the breathing pores of the leaves, and through the surface of the soil. The first cause cannot, of course, be provided against; but a good deal can be done to the surface to keep the moisture in. It is well after soaking the ground by watering or by rain not to turn it up to a great depth, but keep the surface in a loose condition and covered with a mulch of cow-yard manure, the mowings of lawns, or leaf scrapings. Breaking the surface with a hoe or other means of stirring has the effect of breaking or widening the capillary tubes which carry the upward motion of the water, and, as the water must be absorbed by some means, it is taken up by the plants or is carried down.

An important element to be considered in the making of soil is what is known as humus, the black or brown animal or vegetable decaying substances. To maintain a good consistency of humus the accumulations of vegetable matter on the soil, together with manure, must be turned in with the spade. Amateur gardeners often make fatal mistakes in their gardens by raking off all the rubbish, so-called, instead of turning in to decay in the ground. The retention of humus is beneficial in supplying plant food and in improving the texture of the soil. It acts as a kind of mulch, preventing undue evaporation, and consequently keeping the soil moist. In sandy soils this is especially beneficial, and it keeps them warm.

Worn-out soils are the cause of a great deal of disappointment and dissatisfaction in gardening, and during this month, when the summer annuals will be planted out, it is well that the gardener should have some knowledge of the condition of the soil. If it is poor and starved no amount of water on a parched surface will induce plants to flower with any degree of satisfaction. A very good description of worn-out soils is given in an issue of the "Gardeners' Chronicle" which should be very useful to the amateur gardener.

"What are the characteristics of these worn-out soils? As a rule they are light in texture, possess very little cohesion, and fall apart on drying, when also they get a grey dusty appearance, and do not readily take water, as though they were oily in some very slight degree. At certain seasons of the year growth is very free on these soils, particularly in early spring and in autumn; but the growth lacks substance, and is very liable to insect or fungoid attack, so that it is very difficult to carry green stuff of the Cruciferous kind through the winter.

"It is to the lightness of texture that

we must attribute in the main the defects of these soils; they are almost wholly composed of the coarser kind of soil particles, classed as sand, and they contain a very small proportion of the finest particles which may be termed clay. Soils composed chiefly of coarse particles possess very little retentive power for water; the surface exposed by the particles is comparatively small, so that weight for weight there is less surface which remains wet after rain in a coarse than in a fine-grained soil; the channels also between the particles are naturally larger, and allow water to drain away more readily. This explains why the soils we are considering "dry out" so readily, but other consequences also follow. A dry soil is a warm soil, or rather is more easily warmed and cooled, and is, therefore, more susceptible to daily and seasonal changes of temperature than a soil well supplied with moisture. Hence we get a state of things which is not entirely congenial to vegetation—early spring growth due to the ready warming up of the soil, followed by checks caused by short spells of drought which would not affect a soil initially better provided with water, or by overheating while the roots are still near the surface, and lastly a renewal of growth in the autumn, when the warm soil is again provided with plenty of water.

"All such changes and checks tend to curtail the period of growth, and force the plant into producing flower and seed before it has accumulated a proper reserve in its early period of vegetable activity. From the chemical point of view, the small proportion of water retained by the soil affects the crops injuriously; the comparative warmth stimulates those decay processes in the soil which convert the insoluble nitrogenous compounds of humus or manure into the nitrates which serve as food for plants; but, on the other hand, not enough water remains in the soil to bring into action the sparingly soluble reserves of mineral food. Hence the nutriment which reaches the plant is badly balanced; the comparative excess of nitrogenous over the mineral food results in a soft growth, susceptible to attacks of disease.

"Per contra, a moderately strong soil, which is capable of retaining a considerable proportion of the rainfall, and which also is fine-textured enough to be able to lift water from the subsoil by capillarity, only warms up slowly as the season advances. Growth is, therefore, slow and continuous, and not liable to checks through drought; it is also more prolonged, because the ground parts with its heat more slowly in the autumn, just for the same reason as it rises in temperature more slowly in the spring. Such continuous and prolonged growth is the most favorable to vegetation, and results in high quality in the produce."

Assuming that the gardener has worked up his soil to something like a fair condition of richness with its top-dressing of mulch, it will be in a proper state to receive watering. It is a great mistake to water a garden every day. Two or three times a week in the hottest weather is all that is needed. Give a plentiful supply, so that the soil gets a thorough soaking, and the plants will flourish far better than continually keeping the surface moist. The water is wanted at the roots, not on the surface. When planting out annuals, biennials, and perennials this month careful note of the weather should be taken. It should be obvious to any gardener that tender young plants taken out of their nursery quarters to do battle in the open borders should not be moved during a scorching sunny day or a killing east or north wind. A cool, cloudy day, early morning or evening is the proper time. Here is a list of summer annuals that will soon make the garden gay—Asters, Zinnias, Balsams, Coreopsis, Portulaca, Miniature and Double Sunflower, Petunia, Gaillardia, Gomphrena (Globe Amaranth), Cornflower, Amaranthus, Sagetes (Marigold), Cosmos, Cockscomb, Hunnemannia, Jackobaea, Mesembryanthemum, Salpiglossis, Nicotiana, Zea, Rhodanthe, Convolvulus, Mina Lobata.

Every gardener has his or her own particular taste, but it should be remembered that annuals seem to be most appropriate as flowers to fill up spaces. They, however, can be turned into beautiful uses in edgings and designs for borders. We consider all flowers beautiful, some, of course, appeal to taste more than others, but we would like to emphasise the claim of Mina Lobata, a creeper of extreme beauty that will flower in rich profuseness until Jack Frost comes along. Chrysanthemums should already have been divided up, planted out, and labelled. They will go along very well this month without much special care until the topping process comes on. We must advise again the planting of Bouvardias. They are charming bushes, with flowers from the purest white to the most pronounced richness of colors.

There have been millions of Roses during the last few weeks, and to perpetuate their blooming we offer the advice given in "The Gardener" upon summer pruning.

SUMMER PRUNING ROSES.

The summer pruning of Roses is important, particularly as regards the Hybrid Perpetuals and all autumn blooming Roses. It consists in pruning back the shoot on which a Rose has been produced immediately the bloom falls. In summer pruning it is necessary to be careful not to cut the shoot too severely. As a rule, two leaves, buds, or joints should be cut off, and the result will be that two or three of the top buds will break into growth. If strong, all three may remain to produce blooms; but if only of moderate strength they should be reduced to two, and if weak only one must be permitted to develop. When a shoot is very short, then only the flower stalk should be cut off, allowing for a new growth or two from the apex.

In no case should the shoot be cut back nearer the base than five or six buds, not less than this number being left on the shoot after pruning in order to prevent the lower buds from starting, three or four remaining dormant until the winter pruning for the production of the first blooms the following summer. By pruning each shoot as soon as the flower drops, a longer succession of bloom is secured in late summer and autumn than if all the shoots were pruned at the same time.

It is an excellent practice to look over Rose bushes after the first bloom to make sure that they are not overcrowded with weak and useless growths. Stoutness and cleanness are necessary to secure substance and quality of bloom. Ample space for the shoots to develop is imperative, light and air being all important for the consolidation and ripening of the growths. Therefore, Rose growers should not hesitate to let light and air into their Rose bushes, whether standards or dwarfs, by the cutting out of weak and useless growths. If this be done as soon as the first crop of bloom is over, the summer pruning finished, a good soaking of liquid manure or top-dressing of approved fertiliser applied and washed in, and the surface mulched to a little beyond the spread of the growths from the stem outwards with about 2 inches thickness of well-decayed manure, the late summer and autumn flowers will not be much less excellent and certainly as acceptable as the first or summer bloom.—"Pictorial Practice Artist."

Answers to Correspondents.

"Amateur."—The very book you are asking for is just to hand—Bogue-Luffmann's "Principles of Gardening for Australia."

"Chrysanthemum." — Chrysanthemums should be bedded out this month at the latest.

"Knightsbridge."—The cutting sent in is from a Cercis-Judas tree. The popular idea is that Judas hanged himself in one of these trees. The name Cercis is derived from Kerkis, a shuttlecock, of ancient origin.

"Red."—The tree you speak of is probably an Erythrina coral tree. There is a splendid specimen to be seen in full bloom just now in the Adelaide Botanic Gardens, a magnificent sight.

"Tulip."—Yes, the Cape Tulip (Homeria Cillina) has now been brought under the Noxious Weeds Act, and you will be required to eradicate it.

"Rose."—No; Roses are rarely grown in pots in South Australia. But that is no reason why they should not be. Walter Wright recommends the following:—H.P.'s: Baroness Rothschild, Captain Hayward, Mad. Montet, Mad. Gabrielle Luizet, Mrs. John Laing, and Ulrich Brunner. T.'s and H.T.'s: Anna Ollivier, Bridesmaid, Catherine Mermet, La France, Mrs. W. J. Grant, and Niphetos.

"Show."—The finest display of Rhododendrons ever placed on exhibition will probably be seen at the Mount Lofty Gardeners' Show on the 14th inst.

ROSES

SHOWS.

Every town in Australia of any dimensions larger than a small village can boast of a flower show during the months of October or November. It would be an invidious task to attempt a reference even to a fractional number of them. Suffice it to say that the press reports contain strong evidence that floriculture is gaining in popularity, and that competition amongst growers in the country is very keen. While the displays may not be quite up to date in the matter of varieties, there is nevertheless always an indication that fanciers are ever on the alert, even in out-of-the-way places, for the best they can get for staging. Coming nearer the city there is no doubt some of the suburban shows had many exhibits that would have competed well with the professional displays at the metropolitan exhibition. In fact, the show at Norwood claimed, with much justification, to have the finest exhibits of Roses of the season. The exhibitors were more fortunate than those who competed at the S.A. Horticultural Society's Show.

The October Rose Show in the Adelaide Town Hall is looked forward to with keen interest both on the part of growers and of the public. It is the one month of the year when the queen of flowers is at her very best for a royal reception of admiring patrons. Her levee was carefully planned for a week earlier than last year in order to dodge the fickleness of the weather, but the fates were against the officials. The few days preceding the show could not have been spitefully worse had they been ordered by the most malicious designer. It must have been very galling to the exhibitors to see hundreds of their carefully nursed favorites fit for exhibition on one day and then on the next—the day of the show—not to be able to cut half-a-dozen decent blooms. South Australians have not yet awakened to the idea of growing Roses under cover, and the result is that the bushes are an easy prey to every wind that blows and every turn of heat and cold that comes. The climate is notorious at this time of the year, particularly for severe climatic changes, and it is rather surprising that some of the fanciers have not struck the notion of providing shelter. The weather was responsible for a very disappointing show of Roses, and the poor blooms in every exhibit were readily excused. Adversity, however, is a good school master, and possibly the results of this show may have one good effect at least. This should be the fashion of exhibiting. Even up till late in the evening Mr. A. H. Scarfe's prize twenty-four and Mr. H. Kemp's prize forty-eight, held up their heads bravely. This was entirely due to the way in which they were staged —the English fashion of the Douglas case, which provides plenty of water and wire supports for the blooms. These exhibits were in marked contrast to those flowers alongside with their heads flopping about in all directions on their weakened necks. The old fashion method of staging exhibits is abominable. There is neither style, taste, nor any other redeeming feature in it. Visitors go to see the flowers, and if, in their desire to see the beauty of a good Rose they attempt to touch it, they are promptly forbidden "not to touch." There would be no necessity for this peremptory demand if the exhibits were properly staged.

Yet another fault is most provoking. The flowers, being subjected to ill-treatment, fall over and hide their names. And well they might, not only for their own sakes, but for shame of the slipshod fashion in which the names are written. It was most irritating to watch those people interested in the flowers struggling to get a glimpse of their names. Bits of paper, which might have been torn off the edge of a newspaper, with a name scrawled across it in lead pencil is every inch Australian. No style nor finish, anything will do so long as it complies in some measure with a not too exacting rule. In this case a regulation, which reads as follows: —"All exhibits to be named where practicable." Here is another regulation bearing on the point:—"Only the society's cards to be placed on exhibits, except for naming." Why in the name of commonsense should the latter clause be put into that sentence. Rather should it be that only the society's cards to be used for naming. Why cannot the society supply cards properly printed for each section of Roses. The exhibitors would willingly pay for the cards sufficient to cover their cost. Proper space could be left on the card for the name to be neatly written or printed by a clerk, and set up properly on the exhibit, so that "the wayfaring man, though a fool, could not err therein." Why do the visitors want to know the names of the prize flowers if not for ordering and for education generally? And why should the exhibits be always unnecessarily crowded round while the enthusiasts are struggling to get a glimpse of the names. If one or two of the committee were to undertake the responsibility of seeing that the names of Roses, particularly at a Rose show, and also other exhibits, were properly named in the way indicated, it would be a great boon to everybody.

The Carnation Society did well to fall into line with the arrangement of an exhibition at this show, and a fine display it was. The exhibits were nicely set up, and looked well; but the fashion of naming will bear improvement. The constant attention paid to the display was in itself strong evidence of the increasing popularity of this flower, and the blooms themselves were well worthy in all classes of the admiration bestowed upon them.

In all classes of cut flowers the display was good, especially the Pelargoniums. The pot plants of the latter were very fine, though the exhibitors in these have yet something to learn in tying down to make the blooms show to the best advantage.

Special mention must be made of the fruit, which in all classes was very fine. A better collection would be difficult to find anywhere.

The prize dinner-table decoration with Shirley Poppies was artistic enough, but the competition was poor, and the same remark applies to the floral designs and bouquets.

Take it altogether, the show was good, one of the prettiest exhibits in the lot being the Petunias.

SOME REMARKABLE NEW ROSES.

By O. Jacobs Weitendorf,

From "Die Gartenwelt," Sept. 5, 1903.

Amongst the thousands of garden Roses we find such a multitude of showy novelties that we are often forced to ask ourselves, "Do we require any more of them?" When, in the yearly offer of 30, 50, or more novelties, we find so much mediocre stuff, and so little that is really good, we might, on the whole, give this question a negative answer.

But when, out of only a few novelties, a Kaiserin, a La France, or a Testout presents itself, the raiser is startled and the gardener and amateur are delighted. So last year there burst upon us in Undine a novelty of such a brilliant orange and nasturtium-red color as had never been seen before. How great a favorite this medium-sized and very strongly colored rose became at once may be judged by the fact that during last spring several nurseries exhausted their stock of it, and orders are already coming in from America.

If Undine is striking by reason of its color, so is Frau Karl Duschki in form and imposing size. This latter novelty, the result of a crossing between Merveille de Lyon and Caroline Testout, usually develops very strong growth; and in a few years will make a bush about 6 ft. high. The stem, with its strong branches and broad foliage, supports dazzling white flowers of such a size that at a distance they may be mistaken for peonies.

The greatest sensation of the last two or three years has been the production of the beautiful yellow seedlings from Kaiserin Augusta Victoria.

The year 1901 gave us Franz Deegen, Friedrich Harms, and Goldelse. There is still a good deal of discussion as to the comparative merits of these golden rivals; but the general opinion is that Franz Deegen is the best yellow Kaiserin. The brownish color of the wood, the few but strong thorns, the fine gold color and delightful scent of the blossom all suggest to us that Perle des Jardins or some similar Tea Rose must have been amongst its ancestors.

As Goldelse, a sister seedling of Franz Deegen, has the same characters, they are hard to distinguish. If, however, you place them side by side you will see that Franz Deegen both grows and blooms with the greater vigor, although they are equally beautiful. Friedrich Harms has green stems and numerous fine thorns instead of a few large ones, the bloom, too, is thinner and not so lasting as Franz Deegen. Jacob's Perle was shown at Sangerhausen as No. 14, and was favorably noticed.

I must not say anything in favor of this namesake since I raised it myself, and only put it on the market in the spring of 1903. During this summer I proved the value, for show purposes, of the new H.T. Frau Lila Rautenstrauch, raised by Herr P. Lambert (Trier). I am not judging from one single plant, but had more than a dozen specimens of this stately novelty under observation.

The strong stem has a bushy growth like the mother Rose, Caroline Testout, only a few strong thorns on the branches, and stands a little less than 2 ft. high. The broad and beautiful foliage is leathery and shiny. The long bud, conspicuous at the end of a long flower stalk is a coppery orange-yellow color.

With me the fully-opened flower reached a diameter of almost 5 inches, and was well shaped, retaining its form till the withering of the blossom. Although the yellow shade disappears from the fully-opened rose, the rosy flesh tint has a special clearness and softness unlike any other. The broad petals are round, the outer ones slightly reflexed. The charm of this rose is enhanced by a delicate scent. A show rose, with a beautiful name, it should be a favorite for cut flowers; and in any case it is a good garden rose, and will be welcomed by many growers.

In his H. T. Robert Baessler, Herr Hinner (Trier) has brought out a new giant white rose. For the last two years I have been watching two strong plants of this in my own garden. The growth is very strong, like that of Frau Karl Druschki, except that the stems stand up straight. The foliage, of a dark green color, is very leathery, and the wood carries strong thorns. The fully-opened flower is very full, and stands on a long, strong stalk. The color of the flower is white, sometimes slightly tinged with rose. The tree is very floriferous, and blossoms well in autumn. The long stalk supporting each flower makes Robert Baessler a very good white rose for cutting. In the Tea Rose, Souvenir de Pierre Notting, we have a fine novelty of stately bearing. The bush makes good growth, carries fine foliage, and the blossom is large for a Tea. The beautiful buds, with long stalks, are well filled and open easily. The color is apricot-yellow, shading into golden-yellow at the centre, and the edge of the petals is slightly shaded with carmine-red. When full out the outer petals become white, but the gold color of the centre is constant. The bloom, when cut, keeps its color as well as when on the tree, so that we have here another good new Rose for cutting. This Rose should be in every garden; where it is absent, something is lost.

To the list of good white Roses we are glad to add Mildred Grant. This strongly-growing plant is very floriferous, and has beautiful foliage. The individual shoots grow straight up, and the large full blossom also stands upright at the end of a strong stalk. The color of the flower is silver white, the outer petals slightly touched with rose. This, too, is a good Rose for cutting.

Mrs. Theodore Roosevelt is said to be a seedling from La France; this is doubted by many growers. The pedigree, however, matters little. One thing is certain, that this novelty belongs to the good ones of the year 1902. The tree is floriferous, and gives good full blooms, creamy white, with rose centre.

In my garden, Helene Guillot also produces large, lasting flowers of fine form. The ground color is white, but there are shades of clear carmine and yellowish-green.

Herr Hinner gained distinction at Sangerhausen with some good blooms of his beautiful Rose, Pharisaer, which had already struck me as a fine Rose for cutting. The wonderful name of this new Rose startled me until I learned that the chief colors used for the ceremonial garments of the Pharisees were white and rose; these are the chief colors of Pharisaer.

Still worthy of note among new Roses we find Frau P. Lambert (H.T.), which in color stands between Mariann fitzer and Max Hesdorffer.

Among the decorative Polyanthus Roses we have Katherine Zeimet, white, and Aschenbrodel (cinderella) rose colored, as the best.

ANTIRRHINIUMS.

This somewhat neglected flower is deserving of greater attention than is usually given it. Although its merits are such as make it worthy of a place in any garden, not only on account of the many varieties, but in the duration of blooming, and the ease with which it may be cultivated is seldom surpassed by any other flower. Antirrhiniums are not particular as to soil, accommodating themselves to almost any condition. Notwithstanding drought, they may be grown in dry places where most plants would perish. Although in our climate its habit is perennial, the best results are obtained by treating it as an annual. It blooms readily six or seven months after sowing—plants raised from seed sown now would produce flowers in early autumn. By cutting off the spent blooms, and not allowing the plants to seed, flowers may be had nearly all the year. Those who do not care to go to the trouble of raising fresh plants every year should cut hard down to the base after first autumn rains, when young shoots should not be allowed to crowd, but should be thinned out, remembering that the fewer spikes the better blooms. Any particular variety may be increased by cuttings about three or four inches long without a flower (autumn is the best time). Cut below a joint, trim off bottom leaves with a sharp knife, and insert about two inches in soil. It is best to propagate by cuttings those varieties of the striped section which are desired to be increased, as in most cases they do not come true from seed.

Among the many varieties is worthy of mention Dokkies selected striped. Coral Red is good, although the spikes are not so large as in some other varieties, and the color is distinct and new among Antirrhiniums. This variety comes true from seed. Other good varieties are Pink Empress, Yellow Queen, White Queen, Crimson King, Firefly, and Queen of the North, the latter variety being pure white.—Vireus.

GERANIUMS.

The great necessity for all Geraniums (Zonal Pelargoniums) is that they should be kept as dry as possible in winter (unless in bloom in a warm greenhouse); given abundance of air, except during severe frost; and relieved of every scrap of debris and every falling leaf, on which mildew might otherwise settle, for this is their great enemy, which kills more Geraniums than anything else, in winter. Cuttings which have been grown in the open air, having been planted in a border (which is the best plan of propagating them), should be potted up, each singly in a thumb pot, using a mixture of loam, leaf-mould, and sand, and making each very firm in the soil. They will do well in the greenhouse, and should be shifted into four-inch pots, with slightly richer soil, and may then be brought on with more warmth and more water, when they are put out into the borders again.

Older plants can be raised from the borders, their roots shortened, and each potted up singly in the smallest pot, which will conveniently hold their roots, giving them ordinary soil without manure. They will make good plants for the centres or backs of beds which contain lower plants in front, and should be kept absolutely free from withering leaves or any other debris.

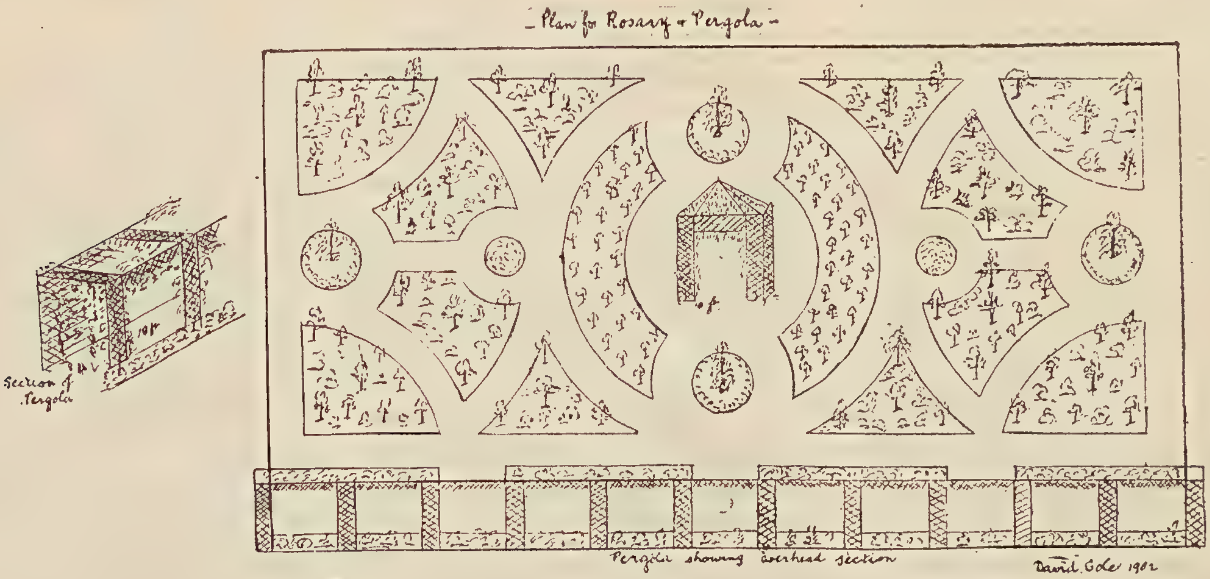
I.

VARIEGATED ABUTILONS.

Some of the most elegant foliaged plants obtainable for greenhouse and conservatory decoration may be found among the variegated Abutilons. They are extremely easy of culture, last long in perfection, and often produce flowers sufficiently beautiful to make the plants worth growing for their sakes alone.

A. Thompsoni is pretty well known among elegant foliaged Aubtilons, as it is frequently employed as a bedding subject in our public parks and gardens; it makes an elegant centre to a bed of dwarfer growing plants such as scarlet Begonias or Geraniums. A. vexillarium igneum is less in stature, but equally pretty, and bears flowers of a very attractive form and color. Tesselatum is a beautifully mottled form of the old and popular A. Darwinii, the progenitor of so many Abutilons; it looks wonderfully well in sub-tropical bedding arrangements, or in the conservatory.

After serving their turn in the summer bedding arrangements the plants may be taken up, carefully potted, syringed and shaded for a few days, and will then form very useful conservatory ornaments during the winter.



TRAINING RAMBLER ROSES.

CLIMBING ROSES ON TRIPODS.---A. H. Scarfe.

BERKELEY VALE, MT. LOFTY, THE RESIDENCE OF MR. R. A. STOCK.

Mount Lofty holds the pride of place as a summer resort for the belated citizens of the sun-brown plains of Adelaide. As the days begin to lengthen out this month and the sun at intervals of an unusually wet winter, begins to indicate something of its gathering power of heat for the fast approaching summer, the hills receive attention. Visitors to the fashionable resort of Mount Lofty by rail invariably watch with interest for the coming in sight of Mr. Stock's garden. Many and varied are the comments made by the travellers as the terraces of Berkeley Vale are viewed from the high level of the railway. Very rarely, however, can the sightseers give anything like a proper estimate of what has been done by way of transformation from a rough, wild, stringy bark scrub into a place of never-failing charm.

The residence is situated close to a road leading to the railway station, and the garden is planned on the top and sides of a peculiar spur hill running some distance out into a well-defined valley. The valley to the right, or northern side, is the rise of the River Sturt, and with the water shed of the hills and various springs, one of the leading features of the garden plan is the arrangement of miniature lakes and waterfalls. Two windmills are in service with force pumps fed by wells to supply the house on the hill, and also a swimming bath of splendid dimensions. The grounds cover an area of about ten acres, and are composed of a variety of soils that will grow almost any kind of plant life. The peculiar formation of the hill, with a gully on each side, is such as would tax all the ingenuity of a landscape gardener to get desired effects to display the beauty of the trees, shrubs, hedges, and flowers. Mr. Stock himself has the credit for the general idea of the plans, which were carried into effect by his head gardener, Mr. G. J. Ackland. The hill has a very steep rise to the summit, and the best test of the success of the planning is gained in the fact that one does not get weary in travelling round about and up and down the mile and a-half estimate of pathways and steps. It can be very easily imagined that with such a length of pathway there must have been a tremendous tonnage of rocks brought into requisition for the building up of the terraces and steps. In fact, rockery is the strongest feature of the whole plan. There are rocks everywhere, and this naturally gives the place a somewhat artificial setting. The artificiality, however, is largely diminished in its formality by the fast growing shrubs and climbers, and here and there a happy blending of the natural and original scenery with the cultivated plant life. Beauty and utility are so happily combined that one forgets the labor of the fifty men that were employed to transform the wilderness into a delightful garden resort.

A few minutes walk from the railway station brings the visitor to the entrance gate, flanked on the eastern reach by a well-grown hedge of Pittosporum undulatum, which hides the house from view. On entering the gates the first object that claims attention is a peculiar looking, though artistic structure, the purpose of which cannot be recognised from its appearance. The pathway leads under a squarely built structure of heavy wooden uprights, given a light appearance by being covered with brushwood of Bursaria. The top of this edifice is round, covered with brushwood, and trimmed into a battlement architectural design. No one would guess that this was a tank carrying some thousands of gallons of water supplied by the windmill pump some 70 or 80 feet down in the gully below. On each side of the gate is a specimen of the weeping Elm, and the main walk from the front of the house around an oblong centre bed to the lawn tennis court, forming the plateau of the hill, is a splendidly grown and well-kept hedge of Cupressus torulosa. Wandering down the left-hand pathway from the gate, we descend a side of the valley devoted to ornamental trees, the conifer family being especially represented by some good specimens of Abies, Auracarias, and Piceas. Two or three Chili pines, commonly known as monkey puzzle (Auracaria imbricata) are making good headway, and also a Golden Lambert (Cupressus Lambertiana). A number of Plane trees, Norfolk Island Pines, Cedars, Acacias, and a conspicuous Menziesii, with its silvery looking foliage, will in a few years fill up a dense mass of growth that will need thinning out. All the stuff in this choice collection is yet young, but the bareness of the landscape is happily relieved by a large quantity of native undergrowth, and of Eucalypts still remaining untouched.

Now climbing the steps alongside a massive breastwork of some tons of rocks, built as a retaining wall for the tennis court, we cross over to the centre garden in front of the house. This garden is divided by curved footpaths edged with Gazania splendens (treasure flower), and the rich orange color of the flowers is a welcome relief to the general deadness of winter bareness. At the corners of two beds we note well-grown specimens of Felicia Augustifolia in their rounded shapeliness and rich green foliage. Other shrubs claiming attention here are Berberis, Pittosporum, Rhus, Pyrus Japonica, Weigela, a number of Roses, Palms, and Pampas. A setting of Dianthus, Carnations, Polyanthus, Verbenas, and Annuals make a good flowering selection.

Moving down the pathway and looking over the hedge we find a row of Planes and Cedars planted alternately with good effect. Looking across the grass land enclosure we note the orchard planted on the opposite slope. This is laid out with choice varieties of apples, including Dunn's Seedling, Strawberry Pippin, Rome Beauty, and Jonathan. The pears include Duchess, Bergamot, and others, while the plums are Golden Drop, Egg, Greengage, Red Magnum Bonum, and Prunes. There is a fine Blackberry hedge, and the bush fruit contain varieties of Raspberries and Currants, black, red, and white. On this rich chocolate loam the kitchen garden of toothsome comestibles is also set out.

Making way along the hedge we note in passing the tennis court that the wire netting is being covered with Roses, the Pink Rambler, Cloth of Gold, and white and yellow Banksias. A break in the hedge is the opening to the first stairway leading down to the terraces, the gardens along the creek, and the upper reaches of the opposite bank. A seat is provided here for weary climbers, and a fine view of the landscape far and near is obtained. Standing here for a moment, and looking across the valley, the one prominent object that catches the eye is a shooting target. This probably is intended to serve no other purpose than to shoot at, but it is placed in such a position that the eye cannot escape it while taking in the landscape. Apart from this, however, the picture is pleasing and impressive. Descending the winding steps to the first terrace a path is traversed some distance round the hill, and on each side are beds of shrubs. A Silver Fir is prominent, and the great Pampas, with waving plumes, Hakeas, Berberis, Piceas, Acacias, Pittosporum, and Pyrethrum grand. make up a good variety, providing a break to the rockwork. A gentle slope leads into a shadehouse of ornamental design for comfortable lounging, afternoon tea, and what not. A steeper sloping pathway, girded with rocks, planted with Echeveria, and from this, covered with an archway of Crimson Rambler Roses, leads on to a terrace of similar fashion to the one above, with trees and shrubs of like species. We note that the Heaths are looking well, and there is a good assortment of them. A few steps down, arched with white and yellow Banksias, and a path brings us to a close view of the waterways and ponds, with their lazily floating Nymphaeas, stately Fourcroyas and variegated Flax, and edgings of reeds, bamboos, and smaller water-loving plants, make a pleasing picture.

Wandering along above the waterway, we come round to the foot of the hill, and there, lying in tranquil repose, is a sheet of water, considerable in dimensions, making a pretty foreground to perhaps the prettiest piece of landscape in the grounds. Nestling under the steep hill rising sheer up beyond is a picturesquely fashioned shadehouse set on each side by a finely grown Blackwood and Acacias, with a native shrubbery, through which is a winding footway. The picture is completed by a rustic bridge crossing the creek and leading to the house. This is a charming summer seclusion, where poetic fancies might be inspired and love sighs breathed while swinging in the fancifully constructed hammocks, tempting to the lovelorn and to those who are born weary. Dwelling upon the surroundings the eye lights upon various water plants—Willows, Magnolias, Ferntrees, Reeds, Bamboos, Cordylines, and tropical looking vegetation. This I take to be the most favored spot in the estate.

As the path leads along up the creek we note a finely grown Willow with a pole standing upright in the centre of the main trunk, and showing some feet above where the tree begins to branch. It looks odd The explanation is that the tree was blown down when younger, and the gardener splinted the broken trunk with a piece of timber. It grew all right and quite strong, but with so many other calls upon his time, the tree surgeon had not time to remove the remaining splint. The same thing happened to what is now a well-grown specimen of Tibia Europa, and only the eye of an expert could detect the place, about a foot above the ground, where it was broken off.

We now reach a second shadehouse, and as it is entered the lovely specimens of tree ferns fascinate the eye. The house has a rockery setting at the back with a miniature waterfall dashing and splashing its little fury into an underground outlet to a large pond in front of the house. The waterworks of this place are ingenious. While on a rustically built resting place the visitor cannot be aware of the fact that he is sitting over a spring of water. Lifting the seat there is disclosed a little water barrel, which is set over the spring in such a way as to make the water escape only through a pipe leading underground to the other side of the house, there supplying a little rockery pool, and eventually flowing into the pond. This pond, with its five feet of depth, carries a good many thousands of gallons, and is edged round the top with rustically built rockwork. I had almost forgotten to mention that when the seat mentioned was raised there was also disclosed a contrivance that carried water tumblers wherewith to drink the pure refresher, not to mention spirits that, if not coming from the vasty deep below, are sometimes associated with the denizens of those regions. This shadehouse is furnished with Draecenas, Asparagus Ferns spreading and growing out on to the roof. Hydrangeas and a variety of pot plants all do well to furnish the place.

We now wind up the footways of the hillside opposite the dwelling house, and on the way notice that salt strewn upon the paths is more effective upon slugs and various pests than when it is thrown upon the flower beds. We come to a large bed of Rhododendrons, and are surprised to see many of them in full bloom and bud at this time of the year. Forced no doubt by the unusual rains. The planting of the beds hereabout looks choice with the Boronias and small shrubs judiciously intermingled with Copper Birches, Oaks, Prunus Pissardi, Pyrus Japonica, Magnolias, Camellias, Escallonias, and such-like ornamental growths.

Still ascending the hill, we reach the target mentioned, but this now takes no prominence, for attention is directed to a rock building set into the hill. The architecture of this is of doubtful origin, although the material of River Murray water-worn rocks would lend itself to a design much less formal, and, we are bound to say, more effective. White quartz pillars support a superstructure somewhat rudely constructed, without much apparent attempt at artistic design. The stones, however, are interesting in themselves, with their fossils of sea-born life and fantastic shapes, moulded by decades of water wearing.

Turning away down the hill, we come to the Rosary and Carnation beds. We note a good selection of Roses, amongst them being such favorites as the Prince de Sagan, Bridesmaid, Countess of Caledon, Mad. Verrur Cochet, Sunset, Mad. de Chatenay, Mad. Jules Grolez, Mad. George Bouland, Helena Gambire, Mad. Eugene Verdier, Rubens, Golden Gate, Louis XIII., and Souvenir de laurent Guillot. The Carnations, too, are all named varieties of good selection.

Thus we come to the end of our visit to Berkeley Vale, and, after climbing to the house again, and, taking another view of the surroundings, conclude that Mr. Stock has spared neither time, labor, nor money, and a very considerable portion of each, to make his hills residence a place yielding much pleasure and delightful rest to a busy city gentleman.

CARNATIONS.

CARNATIONS FROM CUTTINGS.

E. H. Ising,

Vice-President Carnation Society, South Australia.

There are two ways of propagating Carnations—by layering, as it is called, and by striking cuttings. Seed, of course, is a third plan for increasing stock, but as seedlings never come true by any chance, the former methods are the only ones that can be depended on. My object this evening is to say a few words as to method and soil. It is desirable to get your cuttings as early in the autumn as possible; the earliest rooted plants are established and make good root growth, and also make a fair amount of grass before the cold weather stops any rapid growth, as during the months from June to August they are almost dormant. It is, therefore, wise to have your cuttings in at the earliest possible time. Cuttings should be taken as soon as the grass has grown long enough. The prevailing method was to cut off anywhere and plant out in the garden, but those who have studied the Carnation know that the side growth on the main stem is just the right growth if you want to have a reasonable amount of rooted plants from cuttings planted. Great stress is laid by some on the size of the cuttings, and where it is taken from. Given the conditions I have named, I do not mind whether the cutting be 3 in. or 6 in. long; whether it comes from the ground level or from high on the old flower stem. A cutting with a broad base has a much greater chance than one with a narrow base. Not a few split the stem of the cutting. It is not necessary, and those who do so hardly realise, I think, where the roots emerge from. New roots in the Carnation cutting, in the case of one cut to a joint, form immediately inside the epidermis, hence the greater opportunities of a cutting with a broader base. The only possible advantage of stem splitting would be in the case of a small cutting in assisting to expose its greatest possible basal surface. It is important, I think, to realise the principle of rooting in such plants, and to the careful it cannot fail to be an unerring guide.

Soil.—The soil is a vital point, if you are courting success; failure overtakes us often enough without any seeking. It is, therefore, wise to be very careful in choosing the soil. I have found the greatest success when using the following: One-half good sharp river sand, one-fourth each sea sand, and fairly sandy garden soil, all put through a fine sieve and thoroughly mixed; place prepared soil in boxes, or 10 or 12 in. pots. Four inches of this soil is about the right depth. This should be pressed down firmly, so as to make it fairly solid. After planting your cuttings, give a good watering, cover with glass, and put in a fairly shady place; see that they do not get dry, and also see that you do not over-water. If over-watered, your cuttings will soon rot off. The covering with glass is a very important condition in securing rooted plants quickly and thoroughly. It is wise to give the glass a coat of whiting if the weather is very hot. As soon as you see that the cuttings are making growth (and this should be in about five or six weeks) the glass should be gradually removed and plants exposed to all weathers, then pot off into 3-in. or 4-in. pots, and as soon as the roots show through soil to inside of pots, they may be planted to where you intend to grow them. For some years past I have been in the habit of propagating from pipings, that is the side growth on the main stem, and have had very good results from the method herein advocated.

Some growers are very strongly in favor of this method of propagating, and, again, others are strongly in favor of layering. It has been argued that whilst layered plants produce a large crop of grass more or less thickly clustered at the base of the plant, while cuttings have an increasing tendency to produce long growing shoots in contradistinction to the flowering shoots of the layer.

CLASSIFICATION OF CARNATIONS.

F. Fairey,

Hon. Treasurer Carnation Society, South Australia.

In dealing with this all-important branch of our society's work, this paper has been written in the lines of the classification adopted by our society.

Of course, we cannot extend our classes to the same as the English societies, as some of them are outside our realm, such as the Malmaisons, on account of the climatic conditions. This class seems to be going ahead in England, but cannot be grown without the best of glass houses, as most of those know who have tried to grow the old flesh colored Suvr. De La Malmaison, so that to some extent the classes of the Australian societies must necessarily be limited.

The main dividing line drawn, and which

it is desired to make as distinctive as possible, is between the spring flowering and tree or perpetual varieties.

SPRING BLOOMERS.

This class is divided into five sections:

1. Bizarres: Varieties striped or flaked with two distinct colors on a white ground:

2. Flakes: Varieties flaked with either scarlet rose or purple on a pure white ground.

3. Selfs: Those of one pure color.

4. Fancies, which may be any other than the forenamed varieties. This class has been improved to an immense degree, owing to the beautiful yellow tints and shades introduced, and has risen from the most insignificant section of a few years ago to the most popular and beautiful of all, giving the most lovely combinations of colors and delicate markings, practically unknown, even as late as ten years ago. Ravenscroft, in his all instructive book on the "Culture of Carnations," quotes them as the small class of fancy varieties. Now this has been entirely altered, and this class is at the top of the list as regards beauty and popularity, and includes such lovely flowers as Miss Awkright, Artemis, Heather Bell, the Gift, and others of equal merit that we have had the opportunity of seeing at our shows.

5. Picotees: Simply Carnations with an edge of color. These are either white or yellow ground, with a clear, distinct edge of rose, scarlet, crimson, or purple. They may have a wire (viz., thin edge), a medium edge, or a heavy edge, but the edge must be absolutely distinct, any running of color into the petal absolutely disqualifying the flower as a picotee, and making it a fancy variety.

This completes the classification of the spring blooming varieties, and for those who may not be quite certain, such blooms as Purple Flake, which is a perpetual, is not a flake, as the ground color is not a pure white, and you will not find any flakes amongst the perpetuals. Also Artemis, which is described as scarlet flaked lavender, is not a flake, as it has not a white ground at all.

TREE OR PERPETUAL CARNATIONS.

These—the most popular of all our varieties—are mostly well known to us. To secure the society's approval a perpetual seedling must be shown three times during the year, at intervals of not less than two months, thus proving its perpetual habit.

This class is divided into two sections, viz., show and decorative, and again subdivided into show, selfs, and fancies, and decorative, selfs, and fancies.

Shows: Selfs, those of one pure color, and fancies, any other than selfs, which must have a smooth edge and an unbroken calyx to compete successfully in the show trays.

Decoratives: Selfs and fancies which may be notched or serrated, and need not necessarily have an unbroken calyx.

The classification of decorative and show tree carnations constitutes, I think, the hardest task that our society has to deal with, and I should like to give every consideration as to the true meaning of the decorative variety.

It appears that a difficulty is most likely to be made in judging the best decoratives. The tendency, it seems to me, is to try and bring the nearest approach in the fringed or decorative varieties to that of the show varieties, which I maintain is a mistake. Does not the word decorative mean showy, large, brilliant, easy, and graceful? Therefore a large flower, such as Peach Blossom, which I maintain is a typical decorative (but a notorious burster) should be preferred to a smaller bloom, which may have a perfect calyx.

Of course, you have such a lovely decorative as Flora Hill, practically a non-burster, but this is rather the exception than the rule, and I maintain that not very much attention should be paid to a burst calyx in this section, the chief essentials being color and size. Is it not more decorative in the show tray, in the garden, and on the dinner table in every way?

Decorative roses are the brightest, most graceful and showy of all, and why not judge the carnations in the same way? Aim at color, size, and mass, and not at shape principally, is the idea of the true decorative.

Of course, if you can get as large a flower not split, then certainly award it first place, but do not, on any account, award it that merit if it is not as showy a flower as the others, otherwise the true sense of decorative is lost, and the class goes back to the model perfect flower, the only difference being a smooth edge. The great aim of the American specialists, such as Leaver and others, is to produce high-class decoratives with large flowers, long clean stems, graceful habits, and beautiful colors. From them we have Mrs. Lawson and Finance, sold at the highest prices known; Flora Hill, Ethel Crocker, Leslie Paul, imported ones, and Passadena, Juanita, and several others, raised here from American seed, which for ever-blooming character and beauty are some of the greatest favorites, and some florists' work cannot be surpassed. Give your lady friends the picking of your carnations, and you will find your severest losses of flowers amongst your Flora Hills and such-like large varieties of the decorative class, while your perfect flakes and Bizarres will remain comparatively untouched. It has been said that Eve was the first arranger of Nature's garland, and Adam had even then to be advised in his choice of a fig leaf, and if so, why not give Eve's daughters a chance, and let them judge the decoratives? And I am quite sure that all conservatism as to calices, &c., will be broken through, and the true decorative will win the day.

PLANTS IN POTS.

That the culture of plants in pots is considered, especially by those who have practised it successfully to be one of the highest branches of gardening, may be admitted, but there are some cultivators, both gardeners and amateurs, who appear to entertain the belief that it is the best way in which to grow them. This must be objected to except in a few special cases, or where circumstances do not admit of the plants being grown in a natural manner. And, speaking generally, culture in pots is not the best way in which plants can be brought to the highest degree of perfection, and therefore it may be said, as it has been, that it is the worst way. In the case of orchids, for instance, it is more difficult to produce good specimens of many of the species in pots, that they try various other means for approaching the nearest they can to their natural mode of growth, baskets, logs, and other articles being brought into requisition. In the case of shrubby plants, though very beautiful specimens result from pot culture, they are by no means equal to what they might become if they could be grown in the open ground and other circumstances were favourable; a more luxuriant growth would be followed by a proportionate amount of blossom.

Instances are not uncommon where plants that are commonly grown in pots have been planted in the open soil of a conservatory, and, under judicious management, have shown the advantage they have over others kept in pots, in growth, freedom from disease, and general appearance. "When a plant is confined in a pot, its roots," Lindley remarks, "instead of having the power of spreading constantly outwards, and away from their original starting point, are constrained to go back on themselves; the supply of food is comparatively uncertain, and they are usually exposed to fluctuations of temperature and moisture unknown in a natural condition. This cramping of the roots diminishes the tendency to form leaves, and also reduces their size, though it may increase the disposition of flower."

"The exhaustion of soil by a plant is one of the most obvious inconveniences of potting. The organisable matter in a soluble state contained in a garden pot must necessarily be soon consumed by the numerous roots crowded into a narrow compass, and continually feeding upon it, the effect being seen in the smallness of the leaves, the weakness of the branches, the few and imperfect condition of the flowers." In pot culture the various pests and diseases with which plants are infested—green fly, thrips, red spider, mildew, and others—are encouraged and aggravated.

The growth and welfare of plants in pots are also affected by the exposure to fluctuations of temperature and moisture to which they are subjected. It cannot be good for a plant to have its roots in a medium that is liable to be alternately wet and dry, or cold and warm, to which they are exposed in pots. Even the difference between the temperature of day and night affects the soil in pots considerably, to the manifest disadvantage of the roots; while the temperature of the open soil at the depth where the roots are found scarcely varies from day to night or from day to day, only from one season to another, thus during a season of growth a thermometer sunk a foot deep would rise gradually, and at very near the same rate day by day until the maximum is reached, and then decline in an equally gradual manner with scarcely a break in its regularity; whereas in the soil of a pot it would fluctuate by several degrees from one point to another, and the same with moisture, the soil being flood at one time and parched, or nearly so, at another, which is aggravated by the porosity of the pots in which plants are commonly grown; for on a hot day, the pot becoming heated, the moisture in the soil passes through and is lost by evaporation, thus drying the adjacent soil, and, as a matter of course the roots, of which the youngest are generally at the circumference of the ball, to their injury and that of the whole plant. As a matter of course the experienced cultivator takes measures to reduce these drawbacks to a minimum by various means, one of the most obvious being to plunge the pots in some substance that will, at any rate, lessen the fluctuations of temperature and moisture; but that cannot be anywhere, or even generally accomplished. He also practises shading and frequent watering with the same object. In the majority of cases, however, plunging the pots cannot be practised; and this only ought to be done in the cases of plants while standing on the ground in shelter sheds or frames, but plants on greenhouse stages or shelves must take their chance, though stoves are frequently designed so that the pots may be plunged, which must be the case where plants, such as pine apples, that require bottom heat are cultivated; but where plants have to stand on benches plunging is impracticable, and other means must be resorted to for maintaining them in health and vigour. One useful method is to place one pot within another, and if a packing of soil or moss can be placed between, it would have a good effect.

The exhaustion of soil by the roots of plants is one of the greatest evils attendant on pot culture, the organisable matter contained in a garden pot being soon exhausted by the numerous roots crowded into a narrow compass, and continually feeding upon it. By way of remedy, the cultivator applies liquid manure, which produces a good, though partial effect, as it does not contain the whole of the ingredients which go to make up the constituents of plants. Frequent shifting is, however, the most effectual means of maintaining the health and vigour of plants, by enabling the roots to continue their advance into unexhausted feeding ground. Experiments have been tried with pots having hollow sides to hold water; but these are too expensive, and besides, unless glazed, the evaporation from their sides cools the soil, and that worst in the middle of the day, when an increase of warmth might be most beneficial. The same occurs when it is attempted to keep the pots moist by syringing or in a damp atmosphere.

NOTES ON GROWING DAHLIAS.

These plants make such an excellent display in the garden that the grower is justified in giving them generous treatment. Rooted cuttings generally grow into the best plants, though old tubers, if properly treated, are satisfactory. When the latter are planted several young shoots grow, and, unless they are thinned out in due time, the branches become very crowded, and the subsequent flowers are undersized.

All of the sections of Dahlias are beautiful and useful; for filling large beds in the flower garden the dwarf-growing sorts are very effective. A bed of Cactus Dahlias, either of one variety or a judicious mixture, is very telling, and when the plants consist of tall growing sorts, the shoots may be pegged down, when they will quickly cover the whole surface of the bed with a dense mass of foliage and flowers.

Plants grown several feet apart at the back of wide borders are fine as a background to dwarfer plants. Strong stakes should be fixed firmly in the ground near to the main stems of these plants, and the latter neatly secured against injury. All side branches which need support may be fastened to the central stake near to the top of the plant, and to shorter and slenderer stakes placed around the base.

If size of bloom is not material, all stems bearing buds may be allowed to grow naturally; but if exhibition flowers are required, then the number on each branch must be reduced by disbudding. The outside shoots should be removed while they are quite small, and the central or crown bud retained. This course must be adopted generally; sometimes the crown bud does not give the best bloom at the right time, then it is advisable to rely upon a terminal bud, disbudding the others in the usual way.

In dry soils a top-dressing of half-decayed manure should be applied before the surface soil has dried up. Only when the plants are grown in poor land and during a very hot, dry season should frequent waterings of liquid manure be given. But when the case is reversed healthy plants make fine progress without the aid of much liquid manure.

CHRYSANTHEMUMS.

A committee of the National Horticultural Society of France was appointed to act with a similar committee of the French Society of "Chrysanthemists," to ascertain by practical experiment what are the best artificial manures to employ in the culture of Chrysanthemums.

A report was presented to the National Horticultural Society by M. Georges Truffaut giving the principal results of the experiments carried out for these objects.

Nine cultivators, scattered over as many districts of France, first all submitted for analysis samples of the soil they intended to use, no manure of any kind being added.

Each of the nine growers experimented with a single variety, "Madame Gustav Henry," a variety of moderate vigour, and with pure white flowers. M. Nonin alone chose two varieties, viz., Madame Gustav Henry, and Mdlle. Laurence Zédé, a more vigorous variety.

The plants were all grown in three different ways — 1, plants allowed to form three stems; 2, plants with six stems; 3, plants grown without any disbudding. Twenty-four plants were grown in each of these three ways. Each grower thus had seventy-two plants under observation, the total number being about one thousand.

Of the twenty-four plants observed by each cultivator in each of the three sections, four received no manure, and served as control plants; four received a complete manure; four a similar manure, but in double quantity; four a complete manure with no nitrogen; four a complete manure with no potash; four a similar manure from which the phosphoric acid was eliminated.

The principal objects of these experiments was to show by growing in sterile soil (white sand), the influence of nitrogen, potash, and phosphoric acid respectively. The object of the other experiments was: 1, to show the influence of the complete manure in soils of varied character, but of known composition; 2, to study the influence of climate or season on the action of the manures, and the cultivation of one and the same variety.

We cannot give the full details of this most interesting and important series of experiments. Suffice it to say, that the most successful result, as tested at the end of the experiment, was obtained where a double dose of the manure was employed; then came the plants treated to a single dose of complete manure; next in descending order, plants grown without potash, without nitrogen, and the worst of all (except, of course, the unmanured plants), were those plants which had no phosphoric acid.

Phosphoric acid is thus shown to be of great importance to Chrysanthemums, and as necessary to the formation of chlorophyll. Plants deprived of this ingredient had yellow foliage and a weak habit.

Without potash, the plants produced long, weak stems, broad, thick, but flabby leaves, falling off from the least cause. The flower-stems were large, hollow, but limp, the flowers large, but of bad shape.

When nitrogen is absent the plants are feeble, chlorotic, the leaves small and thick, the stems of small diameter, the flowers few in number, hollow in the centre, and of small size.

M. Truffaut, in summing up the results of this grand series of experiments, advises cultivators to prepare a good compost of two-thirds sandy loam mixed with leaf-mould.

Nitrogenous manures, it is found, should only be applied in small proportions, as plants grown with an excess of nitrogenous manure are more subject to the attacks of rust.

Nitrogen is most conveniently applied by means of dried blood, or guano in the requisite proportions; potash is best applied in the form of sulphate; and bone phosphate yields the necessary phosphoric acid. Soluble manures are requisite in the case of plants cultivated in pots.

We have accumulated a good deal of knowledge of the chemical composition of the soil, and also of the dead plant when cremated.

What we want now is a fuller and clearer knowledge of what the living plant does in the several stages of its career, and to this end an analysis of the plant as grown under varied conditions, and at different periods in its life history, is requisite.—"Gardeners' Chronicle."

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The Orchard.

OPERATIONS FOR NOVEMBER.

By W. J. Allen.

It will be necessary for growers to use every effort to conserve all the moisture possible, which can be best done by stirring the ground after rain as well as giving it an occasional cultivation, in order to keep down the weeds and to keep the soil in fine tilth. On no account should the soil be ploughed during the hot months, as this turns up the moist soil which, when exposed to the sun, loses its moisture, which under existing conditions it is our object to conserve, particularly at this time of year. Weeds also pump out moisture from the soil which it can ill afford to lose, therefore under no circumstances should they be allowed to find a place in the orchard, but should be kept down by a thorough system of cultivation.

It will be well this season to thin the fruit a little more than is necessary during an ordinary season, as owing to a lack of moisture in the subsoil it will be found that the trees will be unable to mature the same quantity of fruit as during a normal season, particularly after the drought of last year, which had to a certain degree weakened them. Therefore, if trees have not been cut back heavily at time of pruning, see that thinning is carried out, and err on the right side by doing this work so that too much fruit will not be allowed to remain on the tree, when the chances are that what is allowed to remain will be of good quality and find ready sale at remunerative prices.

Summer pruning may be started this month, and it is well to go over and regulate the growth in all young trees, thinning and shortening back where required—that is, where the tree is growing too thick, and pruning or pinching back so as to keep the tree evenly balanced and symmetrical. This early summer pruning is more for young trees, to aid in directing the growth to that part of the tree where it is most required. December and January are the months for summer pruning the older trees in order to force out fruit spurs and buds.

In districts where the fruit-fly has been troublesome in previous seasons, I would recommend growers to be particularly careful in picking up and destroying all fallen and fly-infested fruits and boiling them, in order to ensure the destruction of all larvæ which may be contained therein. As this is the only sure way at present known to helping to keep down this pest, I would urge on growers the importance of doing their best to destroy these larvæ.

Keep a close watch on all newly-planted trees, and if they show signs of distress make a small basin around the tree and at a distance of at least a foot away, and give the tree at least two buckets of water; but do not allow this to come in direct contact with the trunk of the tree. In making this basin a little soil may be put around the trunk so as to keep the water away. As soon as the soil is dry enough, and before it cakes, have the basin lightly fork-hoed and filled in.

Where irrigation is practised a thorough watering should be given all trees towards the end of the month. This should be the second watering of the season. Be most careful to keep the water confined to the furrows, as wherever the land is flooded it is liable to become hard. As soon as the furrows are dry enough to work, cultivate the orchard twice and loosen around any young trees with a fork-hoe.

Every care should be taken to destroy the codlin moth which makes its appearance about the time the apples finish blooming, lay its eggs on the young fruit and leaves, and, after hatching, works its way into the apple, and within a few weeks emerges and lowers itself down to the ground by a silken thread, and immediately seeks shelter by crawling up the tree and getting into any crack or underneath any old loose bark, either on the tree, on props, or any loose rubbish which will provide a hiding place. The orchard should, therefore, be kept free of such rubbish and all trees bandaged at a height of about 18 inches from the ground. The grubs will harbor in the bandages, and these therefore should be removed every ten days, and all grubs killed. Pick up and destroy all fallen fruit.

Pruning of citrus trees may be continued wherever not completed.

Wherever thorney mandarins show signs of cropping too heavily it will be well to prune them a little more heavily as well as removing some of the fruit from the tree so that the latter will not overbear and exhaust itself this season. If allowed to overbear the fruit will be small and almost worthless.

Budding of citrus trees may still be carried on.

All citrus trees attacked by Maori or fungus diseases should be sprayed with Bordeaux mixture.

Towards the end of the month fumigating for red and other scales may be carried out.

—Agricultural Gazette, N.S.W.

WHEN TO SPRAY FOR CODLIN MOTH.

By Geo. Quinn.

With October and the setting of the fruits upon apple and pear trees in this State the codlin moth begins its season of active depredation. Before the petals begin to fall from these trees, growers would be acting wisely to have their appliances well tested and ready, so that no hitch or delay will occur when the serious work of spraying begins.

From the results of hatching experiments, carried out for several years in the open air, we know the first moths begin to emerge outdoors here in October. On the plains around Adelaide the first moths were found in the breeding cages during the first week in October. No actual data is to hand yet, but in the damp, cool ranges it would most likely be several weeks later. I would suggest some of our growers in each district place a few cocoons in which the winter larvæ in an undisturbed condition are enwrapped, into small boxes to hatch. A good breeding cage may be made by removing the sides from a common cigar box and replacing them with fine muslin gauze. These should be hung in the apple trees. By such an experiment the exact time of the emergence of the first moths in each locality could be determined. The results would furnish an index of when to begin spraying, besides the intense interest always attachable to such an exploration into the realms of natural history. The moths, for which our first sprayings are applied, have developed from the caterpillars which passed the winter in a dormant condition hidden away in crevices and bark of fruit trees, stakes, posts, fruit cases, and anywhere else the insect may have secured a safe refuge when it quitted the fruits at the end of the previous season. I say at the end, because those caterpillars which leave the fruits before midsummer here in South Australia almost invariably pass through their pupal stages and emerge as moths again before the summer ends.

The first spraying should be given when the young fruits are just formed, and the second nine or ten days later. Growers will require to watch the different varieties carefully, as some set their fruits much earlier than others, and must, therefore, be sprayed first. This, of course, applies only to the first and second sprayings. The object of the sprayer should be to drive the spray into the calyx cup before it closes. Later sprayings should be made at intervals, 14 days for the third spraying, and about 20 days between the later operations. The grower must endeavor to keep the fruits coated all over with the spray compound. With the later maturing varieties it will pay well to keep on spraying until the end of February; last year's departmental tests demonstrated very plainly that a mistake had been made in ceasing operations too early.

In connection with this season's spraying I would urge growers to note one or two points. In the first place, if Kedzie's formula for making arsenite of lime be followed—and at present we know nothing affording superior results—at least 6 lb. of fresh, lumpy, quicklime should be used in each 40 gallons of spray. There is a current notion among fruitgrowers that as the arsenite of soda compound is a clear solution, the complete spray, when milk of lime had been added, is a solution also, and therefore needs no stirring when being applied. This is not correct, as the compound of arsenic and lime is practically insoluble, and, although not so heavy or so liable to settle rapidly to the bottom of the spray tank as Paris green, it must be kept constantly stirred if the most uniform results are to be obtained. The best agitating action is one which has a rotary or semi-rotary movement. Thirdly, the arsenite of soda and the milk of lime should be compounded several hours before being sprayed upon the trees. Further, as the arsenic and lime combine much more rapidly with the aid of heat, it would be well to pour the arsenite of soda into the liquefied lime while it is still fairly hot in in the slaking. Care would be necessary to remove the coarse sediment first, otherwise a proportion of the arsenite might be wasted in the after straining. Although up to the present the results from its use have not been too encouraging, theoretically there is no reason why the white arsenic should not be boiled up directly with the fresh lime.

Those growers who have not received a copy of the report on our spraying tests carried out last year should apply to the Department of Agriculture for it, as it is available for free distribution.

—Journal of Agriculture, S.A.

Vegetable Garden.

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OPERATIONS FOR NOVEMBER.

By W. S. Campbell.

Unless the weather is showery during this month, and if water is scarce, vegetable growing is not likely to prove satisfactory, except in those districts where the ground had already been thoroughly well saturated. The use of abundant dressings or applications of farmyard manure and the deep cultivation of the ground are strongly recommended, for this will be found to preserve moisture in the soil better than anything else. Should the weather prove satisfactory, and good showers of rain fall from time to time, vegetables of many kinds are likely to succeed well. Cucumbers, melons, vegetable marrows, pumpkins, and all vegetables belonging to the same natural order, are likely to make most satisfactory growth during the month, should occasional rains fall. In windy places, it would be advisable to peg down their strong growths, or the plants may be greatly injured, unless the shelter of maize, Jerusalem artichoke, or else, perhaps, something permanent can be provided to break the force of the prevailing summer winds, and especially lessen the effect of hot winds, which are likely to visit us at any time.

Asparagus.—The shoots of this vegetable may still be had in the cool districts, if all are gathered as soon as they are suitable for cutting; but judgment must be used, to avoid interfering too much with the growth of the plants and their probable deterioration. The young plants should be growing satisfactorily by this time. If it is found that the plants are blown about much by strong winds, they would be all the better for the support of stakes, or something to protect them. The need for prevention of injury by winds is generally overlooked; but timely attention is advisable.

Beans.—French, Lima, Snake, Scarlet-runners, and Butter may all be sown if required, for any of these tender legumes should succeed quite satisfactorily during this month, and also during the remainder of the summer, provided they can obtain a sufficiency of moisture. Any of these beans may have their bearing or producing period prolonged, if every bean pod is gathered before it matures its seed. And this is the case with other annual vegetables, such as the pea and broad bean. The great effort of the plant, its main object, after arriving at a certain stage of growth, is the production of seed, and should its efforts be interfered with, such as the removal of immature seeds, it will renew its efforts to produce them. Should any seeds be allowed to mature (they need not become what is known as quite ripe) the work of the plant has been completed, and no further efforts to assure reproduction are necessary.

Beet, red.—Seed may be sown from time to time during the month, in order to keep up a continuous supply. The best variety of beet that I have seen is the globe-shaped kind, known as Combination. It is remarkably dark in color, both foliage and root, and presents quite an ornamental appearance when growing. The globe-shaped red beets seem to be much liked, and will probably be grown, in course of time, in preference to the long-rooted varieties. If the soil is dry, the seed is likely to remain dormant until rain comes or water is applied to saturate the soil. When the plants come up and are strong, thin them out to about 8 inches apart in the rows.

Carrot.—Sow a little seed in drills about from 12 to 18 inches apart. The soil should be deeply and well dug; but it would not be advisable to add manure for this vegetable.

Cauliflower.—A little seed may be sown in seed-bed or box. A good deal of care will be necessary to raise, successfully, young cauliflower plants during the summer. Attention to watering the seed-bed regularly, and to proper shading, so that the soil does not become dry, are very necessary.

Celery.—Any well-grown plants may be earthed up or blanched by the use f boards or anything that will keep out the light from the stems. It is desirable to so earth them up or cover them that rain or wet may not have access to the stems. Plant out from the seed-bed a few plants occasionally to keep the supplying going, but unless plenty of water is available, it will be little use trying to grow celery, except a few plants perhaps for use in soups, stews, and other made dishes. Sow a little seed if any more plants are likely to be required, and prick out into small beds when large enough to shift.

Cucumber.—Sow a few seeds where a sufficient supply of plants have not yet been raised. Pinch the leading shoots of plants already growing, and if necessary supply with good quantities of water.

Cress and Mustard.—Most useful, quick growing salad plants, as easy to raise from seed probably as any plants cultivated. They need a good deal of moisture, but a very small patch at a time should give a satisfactory return, and may suffice for an ordinary sized family.

Lettuce.—As the summer advances, it will be found that sowing the seeds where the plants are to grow is the best plan to adopt, for in this way the lettuces are not so liable to run to seed without making hearts, as transplanted lettuces very frequently do. Sow them in rows, and when the seedlings are strong, thin out. Use abundance of well-rotted manure, and encourage growth by the application of liquid manure if there should be any indications of check to growth.

Melons of Kinds.—Seeds may be sown extensively, as after the land has been well manured, not in holes, as is sometimes the practice, but throughout.

Okra.—This is a vegetable not much used, but useful for some purposes, and worth growing. The seed pods, when green, make good thickening for soups and various dishes. Sow a few seeds in box, pot, or seed-bed, and transplant when the seedlings are an inch or two in height 2 or 3 feet apart, in rather rich soil.

Peas.—Sow a row or two occasionally to keep up a supply, and stick when the seedlings are a few inches in height.

Pumpkin.—Sow extensively seeds, say half a dozen together every 8 feet or so apart, and when the seedlings come up, and have made three or four leaves, thin out all but two, or three at the most.

Radish.—Sow occasionally a little seed to keep up a supply.

Rhubarb.—This is a very good time to sow seed, if any young plants are required.

Tomato.—Plant out from seed bed as extensively as may be required. Advanced plants should be trained as they grow to some kind of support. Watch for signs of disease, and destroy by fire all that show signs of the black spot.

A Remarkable Potato.

The most remarkable potato in England at the present time appears to be a variety that has been named Sir John Llewellyn. This potato was sent to the Royal Horticultural Trial Grounds at Cheswick, in 1900, to compete with 42 other varieties that were to be tested, some new and some well-known varieties such as Sutton's Ashleaf, Myatt's Ashleaf, Beauty of Hebron, Ninetyfold, &c. The whole of the 42 varieties were planted on April 19; all made excellent growth, and with two exceptions all produced good crops free from disease. On September 11 the committee were present to judge the trial, and the official report was as follows:—Sir John Llewellyn, Kidney, white, eyes shallow, handsome; the heaviest crop in the collection, free from disease, haulm tall and robust; award of merit. The same year the raiser of this new variety grew at Swansea, South Wales, the remarkable crop of 23 tons to the acre of sound tubers. This was a record in itself. In addition to all the good qualities stated above, it is one of the best table varieties for winter use, being white and floury. Messrs. Horne and Sons, Cliffe, Rochester, Kent, distributed this variety in 1901 at £40 a ton. In 1902, although there were as many more produced, they realised £40 a ton, while in January, 1903, they made the same figure.

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For even now this world, in spite of many far advances which learned specialists have of late years made in the knowledge of its secrets, in spite of the multiplication of sciences, systems, and inventions hard for the general reader to follow. is still our world, the world of all of us; of its varied aspects we should not willingly remain ignorant, seeing with what interest it repays every attempt which we make to understand. The world which "The Century," taking our language as its starting point, approaches to expound for us, is the world of nature as well as of human devices, and we may learn of either from its pages. We may read in "The Century" how photographs are reproduced by the "half-tone process" in our magazines and weekly papers, or what are the points of difference between typhus and typhoid fevers. Knowledge of the world, as "The Century" offers it to us, may be of direct profit; it cannot but add to our interest in life.

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The wise man, if he cannot hope to know everything, will at least take care to know where to look for knowledge of everything, or better still, if he be given the opportunity, he will possess himself of a work of reference which may serve that purpose, so that he may always have at his elbow an answer to the innumerable questions which lie outside the immediate limits of his own province, whatever that may be. And if, furthermore, there is a work of reference which is precise in its information as well as wide in its range, attractive as well as authoritative—and attractive enough to make reference to it a pleasure rather than a trial—he will indeed be a wise man who possesses himself of it. Constantly drawn to refer to it, he will be constantly gathering, not merely separate answers to so many different questions, but, along with these answers, such information as will increase his intelligent interest in all the varied life which goes on around him and of which he is a part. And this lively interest in things—whether we look at it from the point of view of his profit or of his pleasure—is one of the best things a man can cultivate

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Questions calling for answer arise at every turn, but we are so accustomed to let them pass that we hardly hear the call. We allow a question to go by, not so much from inertia, as because we have no one by to answer it, no book to which to turn, or none that attracts us sufficiently For it is not merely because he is more curious that a child asks more questions than a man; he asks so often because he feels sure that his mother must always have an answer for him. Such an implicit faith no grown man does, or should. possess. Everyone, however little reason he may have to trust his learning, must to some extent judge for himself of the sources to which he would turn for information. In the belief that even a brief examination into the merits of The Century will prove the usefulness of the work in meeting many needs, both as a lexicon of words and as a lexicon of things, The Times has prepared a book of 91 pages, from which inquirers may get some idea of the plan and the contents of The Century This interesting book—largely made up of specimen pages, pictures. and articles—will be sent post free on application, with details of the present offer of The Century by The Times, whereby the work can now be obtained at a discount of over 40 per cent., and on easy terms of monthly payments.

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The Australian Gardener

A Monthly Journal of Floriculture and Horticulture, for Professional, Practical, and Amateur Gardeners.

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BUSINESS ENTERPRISE.

Adelaide Station Flower Stall.

Messrs. Smith & Menzel, nurserymen, of Aldgate, have now become established in the city, having opened a flower, plant, and seed stall on the main assembly platform of the splendid new railway station at Adelaide. The stall has a complete glass space of 38 feet, and is a decided ornament to the platform, especially with its tasteful decorations of flowers in ornamental vases and pot plants in choice variety. This new move of Smith & Menzel should be a great boon to the flower loving public who travel, for to be able to pick up a pot plant, a bunch of flowers, or a few seeds and take them at once into a carriage without having to carry them about the streets The firm's specialties, such as their splendid gladioli and delphiniums should make a magnificent display. Carnations, petunias, roses, and tuberous begonias will be other specialties which will be on view in the greatest variety of choice and new sorts. Flowering shrubs and climbers, choice annuals and perennials, of all the very best sorts will be represented by cuts of each sort for country and city residents to select from, and with the very large stock of ferns, palms, asparagus, ornamental leaved begonias, pelargoniums, and many other lines the firm should make a very creditable show. Mr. Fred Smith, the senior partner, will conduct the stall and be always available for advice as to what, where, and when to plant. We wish the firm all the success that their enterprise and pluck deserves.

Correspondents.

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The Flower Garden

OPERATIONS FOR DECEMBER.

Heat, mulching, and watering are the principal elements with which the gardener has to deal during this month. Mulching the surface of the garden plots with stable manure, or anything else that will protect them from the direct rays of the sun, will be found an astonishing economy in the water bill. Not only in money, but in time and labor. The plots should be thoroughly watered once or twice a week, and the next need be only a little sprinkling to freshen up the plants. To wash their faces, as it were, after the scorching heat and particles of dust.

ROSES.

The reception at the courts of the queen of flowers is now just about over, although some of the Roses can be kept blooming by constantly picking off the old blooms and cutting them back to outside buds. If the plants are suffering from mildew it is a sign of weakness. Sulphurise them to clean the leaves, and apply some liquid manure to help the plant, by its own efforts, to throw off the disease.

CHRYSANTHEMUMS.

Chrysanthemums have been growing apace up to now, when they should be pinched back and cut down to six inches. Some growers advocate reducng the plants to two or three inches of the strongest shoots. The after treatment will depend upon the kind of plants required. If for show purposes one stem will carry the one bloom required. This practice is all right for show fanciers whose aim is at size of bloom. But the cottage gardener likes to see a plant worthy of the name, and should leave enough of it when cutting to make a decent show of blooms.

PETUNIAS.

Petunias may be planted out, choosing a cool day, and, if possible, catching a shower of rain. These delightful flowers should be grown in the open beds more then they are at present. Few flowers command better attention, as they have an elegance of their own that distinguishes them at once when in bloom, and they last well, too. For pot plants they are most excellent. In a four or five-inch pot plant half-a-dozen close around the edge. The double varieties are really superb blooms, and when well grown the single flowers are finely veined and colored.

MARIGOLDS AND ZINNIAS.

If your garden has to grow by itself, without any attention whatever, put in some French Marigolds, double and single. They bloom profusely, good colorings, and will grow anywhere and anyhow, and in the droughtiest summer. So will Zinnias, though with a little attention they make better blooms. The hotter the sun the more they seem to smile at other flowers that wilt and wither under trying summer conditions.

CANNAS.

Chief among the fine bloomers during this month and later are Cannas. The fashion that set in for these handsome foliaged and rich flowering plants seems to have been rather short lived. Just why this is so cannot very well be explained. Nothing in luxuriance of foliage can excel them, and the flowers are entirely distinct in form and charmingly colored. One secret of maintaining their beauty for large bedding is not to allow them to grow too big. They look too unwieldy unless alongside a large pond. In the average garden bed they should not be encouraged to grow more than two or three feet, when they look handsome enough, and the flowering is better. It is only during recent years that they have been made to flower at all. The plant is remarkable in this respect, inasmuch as the development of the flowers has not affected the tropical appearance and beauty of the foliage. They can be planted this month in a richly manured bed, and plentifully watered. The name, Indian Shot, refers to the seed, which is very hard, and the natives used them in warfare.

PORTULACAS.

Now, we wonder if it is possible to advance our readers a further step in the cultivation of Portulacas. If you have none in your garden, shy in a few seeds now. They will most likely grow, and if they do, and you nurse them along a little with watering occasionally, some hot summer morning, when taking a walk round the garden not feeling too fresh after the heat, you will be cheered to gladness by the lovely bright colors of those Portulacas. We know of no flower that opens its heart so wide to the rays of heat. The double ones are like miniature double Roses, and the colors are so pure and good.

PHLOX.

We are trying hard to persuade gardeners, the amateur cottager, to persevere in the cultivation of Phloxes. In favored positions of shelter it is not too late now to set out vigorous plants. They look so cheerful. Their tinting of colors and their bright, happy-looking eyes never fail to please and cheer up a disconsolate gardener. They make very pretty table and inside decorations by a set of artistic fingers. For effective show in the border they should be massed, when they will grow to about six inches and form a beautiful setting of color. But for finer sprays of bloom they require room for each plant, say, 6 to 10 inches apart.

VERBENAS.

Verbenas are old-time flowers that we have been accustomed to see carefully cherished by grandmothers, but now they are, like many other good things, out of fashion. But, walking round an old-time and old-fashioned wild garden the other day where many good things grew according to their own sweet will, we suddenly happened upon some lovely Foxhunters. Their bright white eyes and clear red petals were so pretty that we lingered long with the wish that they would come into fashion again. They may be planted out now from layers, and will bloom very shortly.

EVERLASTINGS.

Do not forget the Everlastings (Helichrysum) for your summer borders. They grow well, and if picked just before being full blown, will last until next season in your vases. If tired of looking at them, refresh their faded beauty with a little light foliage of Fern or Asparagus.

GODETIAS.

If seeds of Godetias have not been sown, procure a few plants, and they will be found a nice variety in the garden. Although somewhat characterless, they are profuse bloomers, and color is essential to a well-constituted garden.

NEMOPHILAS AND LOBELIAS.

The charming little Nemophilas must by no means be overlooked. Most delicate and innocent-looking little beauties. Also the Lobelias for edgings. One can never regret seeing the rich blue of these little gems. Even the wild ones in our Mount Lofty hills are worth the trouble of bringing home for cultivation. A sandy soil suits them best.

If any gardener has overlooked Delphiniums and Salpiglossis and Balsams and Amaranths for his summer garden he has been culpably negligent of some of the best of the beauties.

As a parting word for the month's operations, do not forget the Daffodil bulbs. Now is the time to select them, and the sheltered spot, well enriched and cultured, where you intend to see them in all their charm. If you intend to specialise keep them altogether, each row properly labelled. Have your beds narrow so that you can get all around them without any trouble.

Answers to Correspondents

WISTARIA.

What is meant by summer pruning of the Wistaria is this: During the summer, while the vine is in active growth, whenever a shoot attains the length of twelve or fourteen inches, it is pinched back to within two eyes of the previous growth. This pinching back has a tendency to make the buds become flower-bearing instead of wood-producing.

White Butterfly (Pieris teutonia).—This butterfly is unusually prevalent in the hills near Adelaide. The wings are about two and a half inches across, white with black edge, and yellow patches on underside. It is especially injurious to the beautiful Caper plant, upon which it has already laid thousands of eggs. These, if left undestroyed, will soon hatch into swarms of small caterpillars, to tho ultimate ruin of the plant.

MOUNT LOFTY GARDENERS' ASSOCIATION.

HONORARY SHOW.

When the love of gardening carries sufficient enthusiasm to enable gardeners to come together and hold a competition for the pure pleasure of it there is something very refreshing about it. Indeed, it is just the same difference between the close, stifling air of a city and the pure air of the mountains. In the city people live a struggling existence for gain, money being the measure of every standard of excellence, and the shows, perforce of circumstances, partake of this standard. Excellent it may be, but the spirit of it is shockingly mercenary, and the results of the exhibition frequently very bitter. Be all this at it may, it is unavoidable, as the show would not be worth seeing without the professional element. The Mount Lofty gardeners are professional and amateur happily combined to make a genuine success. However impossible this may be in a city, it is not so in the country. There the humble cottage gardener, with his two or three exhibits, takes a prize against the professional gardener, whose time and labor are paid for by a wealthy magnate, and the spirit of rivalry between the two is just as keen as though the prize were a sum of money, and the feeling of emulation a thousand times better. The object of ambition is the highest excellence in cultivation, and the virtues of the exhibits are discussed with a view to know something more about the business of cultivation.

Thus much by way of commendation of an honorary show, and we sincerely hope that the Mount Lofty gardeners will continue with the same splendid enterprise that has characterised their efforts for so many years. In view of this, it is intensely gratifying to know that this year's show was the best ever held in the district. This opinion must be modified in regard to the exhibits, although the plea of adverse weather will hold good by way of extenuation.

THE ROSES.

Where flowers are grown in the open the weather of a day or two before the date of exhibition makes just the difference between a good show and an indifferent one, and no amount of care will make up the equation. It was not surprising, therefore, however disappointing, to find the bulk of the Roses coming below the standard of a November Rose Show. The first casual inspection of the exhibits gave an unfavorable impression, because the visitor expects to see so much excellence in everything at Mount Lofty. Generally speaking, the visitor is abundantly satisfied, but the exhibits on this occasion required more than a casual observation to see their good points, although they were there, and many of them. A bad day's weather may fault a bloom for show purposes, and put it out of court, but the bloom may, nevertheless, carry all the points of form and color that go to

Members of Mount Lofty Gardeners' Association.

Vase of Roses.

make up a first-prize exhibit. The gardener who knows a good thing when he sees it is not slow to set aside the minor faults of weathering, and give the bloom all the credit it deserves. This was the case with several of the exhibits that were staged at the Mount Lofty Show. Taken as a whole, the exhibition may not have been up to last year's standard, but blooms were there—and many of them—that would take a prize anywhere. This is particularly true of the two 24 exhibits of Roses that fought for first place. The blooms were staged by Dr. Pooler and Mr. A. E. Ayers. Many visitors fancied the set shown by Mr. Ayers, but we agree with the judgment in favor of Dr. Pooler, whose blooms were fuller and showed the highest development of beauty of which they were capable. The second-prize exhibit was excellent, but not sufficiently developed. While upon this point of difference as to when a Rose should be exhibited, we would like to suggest a way out of the difficulty that prizes be awarded for buds as well as for blooms. The buds should be of exhibition blooms, apart from buttonhole Roses. There is no doubt that some of the most beautiful show varieties are at their best before they become blown, and a competition in these should be exceptionally fine.

Another point we would urge is a repetition of our remarks upon the Adelaide Rose Show—that is, regarding the fashion of setting them up. We know of nothing to equal the Foster tubes. No exhibitor would ever think of using the old boxes after having seen his blooms set up in all their beauty. The tube carries an adjustable wire standard, and the boxes are made to carry a dozen blooms or less. If every exhibitor bought one for himself it ought not to break his banking account, especially as they last a lifetime.

Yet another point we would urge is the naming. A neat little card, legibly printed, costs next to nothing, but makes all the difference to the interest in the exhibit from a visitor's point of view. It is not only interesting, but educational, and the latter virtue is what the committee should keep in view. The officials could hardly have missed hearing the disputes that arose from time to time amongst some of the visitors as to the classification and names of the Roses. We give the names of the twenty-four first-prize flowers exhibited by Dr. Pooler :—

DESCRIPTION OF WINNING STAND OF 24 ROSES—MOUNT LOFTY SHOW.

The first six roses on the list were raised by Alex. Dickson & Sons, Newtownards, Ireland

1—Earl of Dufferin, H.P, 1887—Globular, dark crimson shaded maroon; vigorous; blossoms best on old plants

2—Lady Helen Stewart, H.P., 1887—Semi-globular, bright scarlet crimson; vigorous; free flowering

3—Helen Keller, H.T., 1895—Vigorous, brilliant rosy cerise. Large shell-shaped petals. Awarded gold medal by the National Rose Society

4—Daisy, H.T., 1898—Moderate growth, large, full, perfectly formed flowers; colour, rosy pink, suffused silvery pink

5—Killarney, H.T., 1898—A most beautiful garden rose of strong growth free flowering, and long buds, the petals of great substance; colour, flesh shaded white, suffused pale pink. In the Rosarian's Year Book, 1899, Mr. Piper (son of the raiser of the rose "Sunrise") says of Killarney :—"I have had this rose under observation for some time. It is of good habit, and. like almost all of the Hybrid Teas, a constant bloomer, with long, pointed buds, made up of large petals that open into a grand bloom"

6—Shandon, H.T., 1899—A vigorous grower and a good flowerer; has large rose coloured blooms with high pointed centre

7—A. K. Williams, H.P., 1877—J. Schwartz. An exquisitely finished bright carmine-red rose. Illustrated as the type of the imbricated rose in the official catalogue of the National Rose Society, England

8—Duke of Wellington, H.P., 1864—Granger Cupped with high centre, bright scarlet, shaded maroon; moderate growth. (Synonym, Rosierists Jacobs Duchez, 1880

9—Maréchal Niel, N., 1864—Pradel. Globular, golden yellow; very vigorous. The finest yellow rose

10—Magna Charta, H.P., 1876—W. Paul and Son. Globular, bright pink, suffused carmine; very vigorous, large and showy; free blooming. Blossoms best on old plants

11—Sir Garnet Wolseley, H.P., 1875—Cranston. Globular, shaded crimson; vigorous. (Synonyms—Mawrice Bernardin, 1861, Granger; Exposition de Brie, 1865, Granger; Ferdinand de Lesseps, 1869, E. Verdier

12—Gloire de Dijon, T., 1853—Jacotot. A rather flat, very vigorous rose; the parent of a distinct, hardy, and strong-growing race of Teas. Color, buff, orange centre; very sweet scented. The Dean of Rochester, founder of the English National Rose Society, says of this rose :—"If ever, for heinous crime, I were miserably sentenced for the rest of my life to possess but a single rose-tree I should desire to be supplied on leaving the dock with a strong plant of the Gloire de Dijon"

13—Alfred Colomb, H.P., 1866—Lacharme; Globular, with high centre, bright carmine red moderately vigorous

14—Viscountess Folkestone, H.T., 1866—Bennet. Globular, reflexed; colour, creamy-white, shaded flesh; moderate; free flowering

15—La France, H.T., 1867—J. B. Guillot, fils. Globular, pointed centre, silvery rose with pale lilac shading

16—Catherine Mermet, T., 1869—J. B. Guillot, fils. Globular, high centre, light rosy flesh; at all stages good. From this rose The Bride Bridesmaid, and Muriel Grahame are sports

17—Constantin Tretiakoff, H.P., 1877—Jamin. Large, rose crimson

18—Baron de Rothschild, H.P., 1862—Guillot, fils. Large, vigorous; colour, red

19—Fürstin Bismarck, T., 1889—Large, full, imbricated. China rose, shaded salmon rose; climbing. A seedling from Gloire de Dijon

20—Baldwin, H.T., 1898—Lambert. Vigorous. In growth and efflorescence it may be compared to Kaiserin Augusta Victoria. The flowers are large, full, and shaped like a camelia; colour, beautiful pure crimson. A most continuous flowering and excellent rose

21—Madame Jules Grolez, H.T., 1897—Guillot. Bright China rose, fairly large, full, and perfect shape, free blooming and most attractive; quite an acquisition to this class

22—Grande-Duchesse Anastasie, H.T., 1898—Nabonnand. Very large, full, perfect shape; colour, salmon rose on a golden ground; fine thick petals. A handsome variety and sweetly scented

23—Jubilee, H.P., 1899—Henderson. Flower large, full, well-shaped; colour, pure red shaded with deep crimson and velvety maroon; free blooming, vigorous. Said to be the finest of all dark roses. A cross between Louis Van Houtte and Prince Camille de Rohan

24—Ernest Morel, H.P., 1900—Cochet. Flower large, well-shaped; colour, clear garnet red, flamed The reverse of the petals velvety. A seedling from Général Jacqueminot.

CARNATIONS.

The Carnation craze which is becoming very general throughout Australia has apparently not taken hold of the gardeners at Mount Lofty, if we may judge by the exhibits at this show. Even supposing the time to be slightly out of joint for staging, many visitors were excusably disappointed with the Carnations that were staged. The Carnation Society held its first show in Adelaide on the same afternoon, and it is a pity the two dates clashed. Whether this was unavoidable or not there is no doubt that, as the show in Adelaide staged a splendid collection, it was fully expected that Mount Lofty would also have some good blooms set out. Regarding those staged we can say nothing, but would suggest that when the catalogue is arranged for the next show the Carnations should be divided into the two sections of "show and "decorative."

RHODODENDRONS.

A table running nearly the whole length of the hall carried a mass of bloom that can be only appreciated when seen. The luxuriance of beauty is beyond the descriptive power of words. To say that it was pretty, beautiful, and charming is merely a collection of adjectives all meaning the same thing in differing degrees. Every shade of color from pure white, through the pinks, and red to deep purple, was represented there in profusion, the only regret being the necessity to place the exhibits so closely together. But, says the official, "what can one do with such great blooms in a limited space." Professor Stirling stills leads the way on the prize lists with this flower, and all praise to him for introducing such a beauty into the hills gardens, but we were glad to notice that other growers are entering the lists against him. Other exhibits were staged from the gardens of Mr. Tom Barr Smith, Mr. W. Milne, and Mr. H. Sewell. It is invidious to pick out special varieties, but we noted that visitors were attracted by the blush white Queen, the dark-eyed Beauty of Bagshot, the fine scarlet of Lord Wolseley, and the splendid colors of the Waterers. Many enquiries were made for the queen of the show, Pink Pearl. The explanation offered for her absence was that the weather had spoiled her chances this year of being included in the prize exhibit. Even so, we think it a pity that one or two clusters were not labled "not for competition," the weathering would not have detracted from their beauty as an exhibit.

We give a picture of the bed of Rhododendrons from which Professor Stirling's prize exhibits were taken.

Another exhibit that claimed repeated admiration were the twenty-one pots of Calceolarias staged by Mr. Robinson. They were all in splendid bloom, and the distinctive variation of colors showed them to be a good strain. That Ericas can be grown to a healthy perfection in the Mount Lofty climate was abundantly proved by the fine show of lovely colored spikes by Mr. George Smith. Mr.

Sewell's gardener had on show a nice collection of rare plants and shrubs that claimed a good deal of attention. The attractive spike of Lupins should surely disabuse the minds of those who regard these flowers as something akin to weeds. They were all of one variety, but there are numbers of others that are even prettier, and we should like to see them taken up for general cultivation. The dainty delicate Pyrethrums were also admired, and if space permitted we might go on detailing numbers of other beautiful selections. The bouquets and art decorative works were all good, and, taken as a whole, we congratulate the Association upon its show.

Rhododendron in Dr. Stirling's Garden.

S.A. CARNATION AND PICOTEE SOCIETY.

NOVEMBER SHOW

The exhibition in Marlborough Chambers, Waymouth-street, on Saturday, November 14th, was something in the way of a revelation to large numbers of the visitors, and it was a pity that the enterprise of the society, which had brought together such a fine and representative show, should have failed them when the subject of accommodation for the display was in question. The flowers had to be too closely crowded, and thus the maximum of effect was not gained, and the number of patrons was so great that it was difficult to properly inspect the exhibition. In arranging the exhibits every care was exercised and the secretary (Mr. D. F. Laurie) is to be complimented on the excellent classification adopted, and the facilities provided for distinguishing the various sections. The boxes, vases, and specimen tubes were well set out, and each flower was accompanied with its natural foliage, excepting in a few cases, where asparagus fern was suitably introduced. A glance at the various classes showed the strides made by the society during its short existence. Only three years ago Adelaide boasted not more than two persons who specialized on the carnation, but to-day over 50 own allegiance to the new society, and many of these possess all the best Sydney and English varieties. The blooms entered for the champion classes were the special attraction in the show. Mr. A. Holton was the successful grower in spring-blooming varieties, and carried off the premiership with a handsome Mephisto, an English flower, of deep crimson, from a recently imported plant. Dr. Harrold's yellow and crimson, Miss Arkwright and Mr. [illegible]sing's pink-tipped yellow Voltaire were other prominent blooms and Mr. F. Fairey's lily-white Trojan was a magnificent representative of a species which evidently ran the variety F. W. Girdlestone for the position of the most popular forms of carnation with growers. In tree or perpetual show carnations Mr. F. Fairey carried off the championship (for an Erskine, yellow with faint pink markings) and all the first prizes. The decorative tree or perpetual premiership was won by Dr. Harrold, who scored most successes in the decorative class. He staged a lovely Pasadena, which had a white ground, slightly tinted with pink, which was boldly striped with a darker tone. A good flower was the Mrs. Gazard, a self colour of pale pink, shown by Mr. F. Fairey, which, however, was passed by the judges. The collection of 12 spring-flowering sorts shown by Mr. A. Holton was a splendid exhibit in a fine group of competing collections This grower secured several well-deserved wins in other sections, and his picotees were in each instance deservedly placed before those of Mr. J. H. McInnes, whose consistently high standard of production manifested in previous flower shows was, however, well maintained in the specimens he had on view One of the most beautiful stands in the room was in the spring-blooming section ; it was the six self-coloured spring blooms shown by H. Blinman, and consisting of five faultless white Trojans and a lemon yellow Cecilia The flowers were selected by nearly all the visitors as the finest collection on exhibition The vase class also brought grand competition, and here Mr. Bertram, with six lovely Girdlestones, won from Dr. Harrold, who entered half a dozen prime Flora Hills The judges—Messrs. Pengilly and Binney—said that without doubt the carnations were from every point of view the finest ever exhibited in Adelaide, and would be a credit to any carnation show Several non-competitive exhibits of carnations were shown by the different growers, and added much to the success of the whole—The "Register"

EUONYMUS JAPONICUS.

Such a beautiful evergreen as is the Euonymus japonicus would be in more demand than it is, notwithstanding it is sometimes partly injured in winter, were it not that it is so subject to a scale which disfigures and destroys it. Many of the usual remedies for destroying scale cannot be used on the Euonymus because of injury to the foliage, but there is a simple remedy available in the shape of common soap suds. A mass of suds, made as thick as possible, will rout the scale; but it is best to give two or three doses through the season when the scales are numerous. After a good clearing of the bush of the insect, a good dose of suds every year should suffice. Early summer finds the young scale active, and a drenching at that time is advisable. The underside of the leaves are often badly infested, and to reach these a handful of thick soap suds may be taken and the branches run through it. This catches those on the underside.

This Euonymus is a capital seashore plant. It does not kill back near the coast as it does in land. From Cape May to New York, along the New Jersey coast, there are many fine ones to be seen. But all through southern New Jersey, whether near the shore or not, it flourishes, the sandy soil seemingly being just what it likes.

You can have "The Australian Gardener" posted to you for 12 months for 3s. 6d.

Some Notes on the Cross Fertilization of Carnations.

By FRED. C. SMITH.

Owing to the lack of experience of growers in this State, I have been unable to gather any information as to the varieties which, when crossed, are apt to give the maximum of results. Some data on this point must have been gathered by growers in the other States, who have for years pursued this fascinating phase of Carnation culture, but, although I wrote asking for information, I could get practically none.

I have, consequently, merely to describe the process of cross fertilization, and touch upon a few points which may give rise to discussion and argument, and help to bring out some experiences of value.

As in most flowers, the ovary forms the centre of the flower, and out of the ovary or seed-pod rise two or three pistils. These usually curl over toward the outer edge of the flower; upon the upper edge of the pistils is ranged a number of hairs. When these hairs are standing up in a fluffy condition they are in a proper state to take the pollen.

The stamens or male organs of the plant will be found attached to the petals, each carrying a small cup at its extremity. This, if in a healthy normal condition, contains the pollen or powdery dust. This pollen should be dry and loose to be readily transferable. A camel hair brush is usually advised for transferring the pollen from the anther to the hairs of the pistil, but I very much prefer a watchmaker's pliers. These have very long slender jaws 3 or 4 inches long and broad handles, and one can grip the filament-like stamen close up to the anther and rub the pollen off along the brush of the pistil. If impregnation takes place the petals will be found limp and drooping next day. If not, the process needs to be repeated. When the crossing is done a small label should be attached to the stem of the flower giving the names of the seed and pollen parents. From about 10 o'clock to 2 o'clock in the day is the best time to do the crossing of this flower. It is well to pull the petals apart a bit when the pod is forming to give it all the air and light necessary for healthy seed forming. In casting about as to what varieties to cross you may either select the flowers that happen to be out or wait till those you wish to use are out.

The qualities desired in the seedlings must as a rule exist in the parents. There are several things to study when planning your ideal flower. You want a perfect calyx, smooth petals of good substance, clear distinct colors, size, and scent, and compact habit of growth of plant. The seed or female parent should here be chosen for its length and breadth of calyx, and it should not carry too many petals. The pollen parent may be a fuller flower with a good unsplit calyx, both if possible should possess good color, perfume, substance, size, and smooth petals.

It will probably be found far more profitable to pollenise a flower that is almost single from one that is fully double than to use two full flowers for the purpose. The original parent of the vast variety of Carnations of to-day was a small single flower, and Nature evolved a single flower as the type best able to withstand all adverse circumstances, so a single flower pollinated from a full petalled bloom should give vigor and the right constitution, while the other qualities may come from the pollen parent.

As showing the difference between field grown and naturally fertilised seed and hand crossed seed, I may say that 4 or 5 years ago we paid £3 for 240 seed of some 25 crosses of American varieties grown under glass. Several thousands of "field-produced" seeds were given in free. From the 240 seeds 200 plants were raised, and out of these we named over a dozen fine flowers, while out of 2,000,000 plants of the other seed not one has yet been named.

It will be interesting to find the relative values of the border and the Australian trees and the American perpetuals as parents in the improvement of our Australian perpetual type. The probabilities are that the use of border varieties to gain compactness will throw back the gain in other directions. As far as possible the gains already made by other experimenters should be utilised, so that the advancement may be more rapid. In some classes of plants, however, the gain in color, size, &c., has been unwisely made at the expense of vigor, and this must not be forgotten.

Although it may be better to cover the flower when once crossed, I do not think that not covering will much affect the general resulting average. It seems to me that if an ovale is once impregnated it is done practically once and for ever, and no further pollen influence can affect it.

THE GLADIOLUS.

[From "The Garden."]

Consisting of nearly 140 species, the genus Gladiolus is a large one, but of these a considerable number are of small garden worth—at any rate, compared with the magnificent hybrids associated with the names of Suchet, Lemoine, and Max Leichtlin on the Continent and Kelway and Burrell in our own country. It is of these latter I propose to give my cultural experience, but, before proceeding to details, I think it is advisable to touch on a section of early-flowering Gladioli which are largely cultivated on the Continent, and deserve much more attention by us than they seem to get.

I refer to the varieties and hybrids of G. blandus, G. ramosus, and G. cardinalis, fitly associated together, as they may be planted in the autumn, flower in May and June, and can be lifted in August, when, after sorting, they may be replanted later in November. The blandus (nanus) varieties are the dwarfest, averaging from 1 foot to 2 feet, and flower in May in the open ground; ramosus and cardinalis varieties average 2 feet to 3 feet and over, and flower in June and July. Nearly all the named varieties listed in the Dutch and French catalogues are worth growing, and some are of great beauty, lasting well when cut, for, though the pips on some spikes are not very numerous and of somewhat fugitive duration, they open in quick succession.

A deep, rich, well-drained soil and sunny site suit them; the chief protection they seem to require is from excessive wet in the autumn and winter, and from winds and pelting rains when the spikes appear. Without this protection, unfortunately, the usual sequence of climatic events in this country goes against them, and mild autumn and winter rains induce premature topgrowth, which, though capable of enduring a good deal of dry cold at that season, resents exceedingly the succession of freezing and thawing which generally occurs with us. They are charming in pots if plunged outside in coal ashes and kept fairly dry till the end of February, when they may be allowed to come on gradually in a sunny corner of the greenhouse. Place from three to six corms in a 5-inch or 6-inch pot, with good fibrous loam and coarse grit and very free drainage. The water-can needs restraint till growth indoors is active, and then a pinch of a good fertiliser in the pot is a great help. After flowering plant them out in a warm corner to complete growth and ripen. The following is a selection of charming varieties:—

Blandus Section.—Blushing Bride, white and crimson; Carnot, scarlet; Eulalia, rose; L'Unique, orange; Peach Blossom, pink; Salmon Queen; and Sydonic, rose.

Ramosus Varieties are not so numerous, but Amsterdam and Queen Victoria, red and white flaked; Van Speyk, salmon-pink; and formosissimus, scarlet and white, are good. G. cardinalis and G. insignis are also brilliant reds and very showy, flowering with the above. Next in order of flowering are—

Lemoine's Hybrids, originating from a cross between G. purpureo-auratus and G. gandavensis. This resulted in the introduction of Lemoinei and Marie Lemoine, two varieties which, though thought much of then, are nowhere now. The small hooded type of flower and the harsh contrasts of color are giving way to varieties with stronger spikes, large well-opened flowers, and colors of beautiful harmony and softness, extending from white to the deepest maroon, and including several forms also of violet-blue shades. In the production of these no consistency of hybridising appears to be being adhered to; in fact, I believe that in a few years' time there will be no clearly defined types representative of the various sections of Gladioli classed under the names of Lemoinei, Saundersi, and gandavensis. The only important differences will be habit and time of flowering.

However, at present the Lemoinei hybrids are distinct enough in many cases by flowering earlier (July), in having more slender peduncles, and flowers from 1 inch to 3 inches across, with the basal segment or segments usually blotched or spotted with a color different to that of the ground color. Their culture is identical with that of the next two sections. I have not found them appreciably hardier or any advantage in autumn planting. Some of the varieties are positively ugly by reason of the harsh contrasts of color. The hooded flower is also to my mind highly objectionable. The following varieties are, however, very pretty:—Venus of Milo, white, purple spot; Princess Altieri, white, crimson blotch; Gil Blas, salmon, large blood-red blotches; Devil de Carnot, crimson; Lacordaire, fiery red; M. Lereque, crimson, pencilled yellow; Eldorado, yellow, dark blotch.

The varieties of garden Gladioli included under the names of

SAUNDERSI, NANCEIANUS, AND CHILDSI

are, or were, originally hybrids between G. Saundersi (species) and varieties of Lemoinei and gandavensis. This cross resulted in a type of plant having very large open flowers, too large often for the peduncle, which partook of the character of G. Saundersi in being rather weak. Personally I do not think the majority of varieties of this section are any improvement in themselves on those of gandavensis forms, the flowers being very often loose and flimsy in petal and just as ugly in form as the hooded type of Lemoinei. The colors also, in quite a number of varieties listed in catalogues, are not pleasing, and, what is an important character from a decorative point of view, there is not usually an orderly sequence of development of the flowers up the spike. Two or three gigantic flowers at the base will open and wither before those above develop, and these are very much smaller, out of all proportion in fact. Nevertheless, the introduction of this section will, and already is, leading to grand results. Careful and judicious crossing between the sturdy varieties of gandavensis, with their thick-set spikes, and good colored varieties of Saundersi is resulting in Gladioli of splendid type, with the faults on both sides of the parents nicely corrected.

A few good varieties are Abbe Roucourt, deep crimson; A. R. Smith, carmine and yellow; Ferdinand Kegeljahn, orange and salmon; Pacha, orange. And under the Childsi group are Kitty Leyland, very large rich pink; Mrs. Bird, rose; Ben Hur, a very large flowered but dwarf variety, with a much dotted and pencilled pink flower. A number of the Childsi varieties are, in my opinion, very much overrated.

Coming now to the best known, the most cultivated, and still the most useful, as well as the finest sections, the varieties of

G. gandavensis, we may as well refer to its origin, or what is said to have been its origin, viz., a cross between G. cardinalis and G. psittacinus, though I believe there is no doubt that G. oppositifolius is accountable for the origin of the light ground varieties, the whites and purples. Anyway, the best types of G. gandavensis are magnificent garden flowers. Every color except clear blue has been attained, and the most fastidious sentimentalist may be satisfied with the perfection of form and bearing of their massive spikes, whether as seen in the open garden or when cut for the decoration of the house. Their cultural requirements are not exacting. There are certain conditions under which they will not thrive, but these are few; they cannot endure shade of any kind, and prolonged drought induces abortion of their spikes and premature ripening, hence they rarely succeed in dry, shallow soils. Organic manures should be kept away from their corms. On the other hand, if an open site is obtainable, I believe Gladioli can be successfully grown in any soil, provided it is (1) deeply worked 2 feet at the least, (2) made firm before planting, (3) and an abundant supply of phosphatic fertiliser be afforded. The two first considerations are best effected by autumn trenching, or at least bastard trenching. The soil then settles down naturally during the winter. As to the third, basic slag, along with a good dressing of stable manure dug into the second spit, is, perhaps, best for stiff loams, clays, and genuine peaty soils. On lighter soils steamed bone flour is preferable. In both cases let the application be liberal the first time, say 1 lb. for every 3 square yards. For really sandy soils superphosphate of lime 3 lb. along with sulphate of potash 1 lb. for every 3 square yards raked into the top spit about a month before planting gives markedly good results. A regular dressing of slaked lime over the beds during the winter at the rate of a bushel to the rod the first time, and half this quantity each succeeding winter is nearly always of great value. Gladioli especially seems to appreciate it, moreover, it is worth noting that superphosphate has been found by experiment to fail in the absence of a sufficiency of basic lime compounds in the soil. Twice during the growing season I give my beds a sprinkle of nitrate of soda, 1 lb. to each 10 square yards, the first time in May and again in the first week in July, the results this rainy season have been most marked, some untreated beds being far behind the nitrated beds in vigor. If the above procedure as to chemical fertilisers seems complicated, then try a combined manure (after trenching and manuring in the ordinary way) such as Clay's. Use as a top-dressing 28 lb. to the rod after planting, and again in June, raking it well in between the rows.—W. C. BULL.

Down here in the south-east of England I like to begin planting as soon after the middle of February as the soil will allow, commencing with the Lemoinei, and complete planting by the first week in May. The corms are put in 5 inches deep in beds 4 feet wide, with 2 feet between the beds, the number of rows in each bed depending on the size of the corms, but for convenience in staking, weeding, and getting among the plants when in bloom 12 inches apart each way between the large corms should be allowed.

I wish I could speak with experience as to the date for planting in the north, but I do believe in as early planting as possible. A great deal depends on the drainage of the sub-soil, but Gladioli will stand a lot of cold if the soil is not wet and stodgy, provided well ripened corms, which have been kept very cool all the winter, are put in. North country growers should, however, always stick to early-flowering varieties in each section.

Staking with 4 feet or 5 feet bamboos when the tops appear, keeping the top inch of soil loose and clean, releasing the spikes from the sheaths when the bracts of the flowers get caught just as they emerge, and keeping a look out for caterpillars in the opening buds, are the chief cultural details during the season.

In late October and November lifting should be done regardless of the degree of maturity of the foliage, though naturally one would lift the yellow-leaved plants before those still in active growth. A mild rainy November will often start the corms rerooting, though the tops may still be quite green. A dry day should be chosen, the plants lifted entire, the labels tied on, and the whole batch spread out in single layers in a dry shed to mature. Protection must be given against actual frost. The tops when dead should be cut off close to the new corm, and the old defunct corm below, with its withered roots, separated by a sharp pull, when, if the new corm is mature, a clean dry scar is left, a natural line of separation between the two corms having been naturally effected by the formation of a few layers of brittle cork cells during the drying process.

The offsets or spawn, if to be preserved for increasing the stock, should be put into a small paper bag and labelled. Offsets attached firmly to the corm when lifting are best left on till cleaning up takes place. The number and size of these offsets vary much; often the most beautiful varieties yield none, while rubbishy plants may yield dozens. While out of the ground the corms should be kept as dry and cool as possible. When dry they will bear safely several degrees of frost, but in a damp store-house immature ones get mouldy and rot and mature ones root prematurely. If loose, then shallow wooden boxes where the corms can be spread in single layers are the best receptacles. As regards

Diseases there are several fungoid parasites; one quite common in this country appears on the leaves during the summer as brown spots. Sometimes the plant grows through the attack, but often the spotted area spreads, the leaves turn yellow, and the whole plant dies. On lifting in the autumn the corm is found to be either a rotten mass or else spotted with what I believe is the resting stages of the fungus. I find that, except in severe cases, if the spots are picked out with the point of a knife and the wound dusted with a mixture of equal parts of quicklime and sulphur the corm grows away in the spring, and often a choice variety is saved in this way. The best preventive (cure there is none so far) is to grow the plants on a fresh site if possible every year, and clean the old sites with a crop of, say, cauliflower or early potatoes; at least, such has been my experience. Wireworm and the daddy grub or leather jacket when troublesome must be trapped in the usual way with a few bits of rape cake attached to a piece of copper wire and just buried in the soil. Gladioli may be raised from

Seed by anyone having the patience to wait two or three years for a spike of bloom. Both seed and spawn are best sown outdoors under hand lights in April, covering with an inch of gritty soil. The resulting cormlets need identical treatment to the large corms, only they can be planted much more thickly and only two inches deep their second year. Seed can be bought or saved by one's self if artificial pollenating be performed, cultivation having enlarged the parts of the flower to such an extent that it is rare to get a capsule from flowers left entirely to the visits of insects. I give now a

Selection of Good Varieties which can be bought at a reasonable figure, and which I have had an opportunity of proving:—

Reds.
- Grand Rouge
- L'Ineeudie
- Prof. Maxime Cornu
- Iona (Burrell)
- Martial (Burrell)

Roses.
- Glaire de Feu
- Mme. Poiret
- Pyramide
- Pasteur
- Liley
- Opale

Whites.
- Hilda (Burrell)
- Dora Craven (Burrell)
- Cygnet (Burrell)
- Shakspeare

Bizarre vars.
- Comedy (Burell)
- Hesperide
- Parure
- Amitie

Yellows.
- Diademe
- Bernice (Burrell]
- Casilda "
- R. Milner (Kelway)
- Rajah

This is, of course, a very incomplete list of the finest varieties. It only pretends to give two dozen, which average not more than 10d. each. None are more than 2/, and some 5d. and 6d., but all are very beautiful.—W. C. Bull.

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REVIEWS OF BOOKS.

THE FOREST FLORA OF NEW SOUTH WALES.

By J. H. Maiden.

Part V. of this exhaustive work is to hand. As with the preceding numbers, so with this, we have nothing but praise to bestow upon it. The information upon the trees of our forests is full of minutest detail, botanically, in narrative description and in economic value. The average Australian is nothing if not practically commercial when he takes an interest in his surroundings, and Mr. Maiden is taking great care to meet the requirements of economists. Opinions upon the merits and demerits of the wood and other economic values are set out from a number of authorities who have dealings in the business of values of timber and its varied uses.

Each subject is illustrated in all essential particulars for identification, and in all respects the work is maintaining the high standard of excellence with which it was first introduced.

"VEGETABLES AND FLOWERS FROM SEEDS IN TROPICAL, SEMI-TROPICAL, AND TEMPERATE CLIMATES."

This is a new book published by Sutton and Sons, of Reading, and printed by Spottiswode in their most elegant fashion. Nothing too good can be said about the get up of this book as a work of the printer's art, the letterpress and illustrations being splendid. What is true of the printer's art is in measure deserved by the information imparted. The first section of the book deals with vegetables, and we venture the opinion that any gardener, who may be the merest tyro, could read the information set out there, and with only the exercise of the commonest garden variety of intelligence, supply his kitchen with vegetables all the year round. The book tells him everything he need be told, the only thing lacking is that it won't grow the vegetables itself, although, to tell the truth, the pictures of some of the vegetables, potatoes, to wit, would make any Irishman's teeth water. A good feature in the compilation is that the proper months are set out for sowing the seeds in different countries This information may not be strictly accurate, because of the great variation of climate, but generally speaking, where spring, summer, autumn, and winter are not specified by particular months the information is reliable enough for general purposes.

After giving a great lot of detail upon individual vegetables, this section of the book is concluded with a chapter upon "The Chemistry of Garden Crops." The subject is treated from an English point of view, naturally enough, but the general information contained regarding the constituent properties of soils and their treatment is just as good for the Southern as for the Northern Hemisphere. The same properties prevail all over the world, the only difference being in their proportions of chemical elements and the influence of atmospheric conditions. The whole question is summed up in the author's remarks that what the soil lacks naturally must be provided for artificially. This surely is true of every garden in the world since the time of Eden, though what our first gardener parent knew about the business does not appear in ancient literature. A certain charm about the information of a practical character is what one might call out-of-the-way knowledge—that is, remarks that one does not meet with in the usual run of garden literature. For instance, in the chapter on celery we are told that the ideal soil for growing celery is from an anthill. The insects are said to place every separate atom in position by means of a secretion which enhances the fertilising quality. We venture to think that not every gardener knew that before, and we may further risk the idea that it is not every gardener who would care to try the experiment of carting an ant-hill to his celery patch, especially if the hill were from the species commonly known in Australia as bull ants. A nip from one would make him swear off ant-hills and their adaption to celery growing for ever. If any kind of anthill would serve the purpose there are some places in Australia where gardeners could make a small fortune out of this delightful esculent. We refer to the northern regions where the industrious ants build their hills as big as small houses.

The second section of the book deals with flowers. The first striking feature to the searcher after knowledge is the method adopted of placing the subjects in alphabetical order. This is a distinct advantage to the amateur cottage gardener not learned in the intricacies of plant orders. He can set aside any ignorance on this score, and at a moment's notice turn up all the information he requires without any other education further than the ability to say his ABC and a smattering of reading. Everything is studiously simple, and yet full of information for scholars. Almost every flower in common cultivation is illustrated and so beautifully designed from nature that it is impossible to mistake an identification. In addition to the alphabetical order of the book, there is a complete index, and nothing wanting to assist the amateur gardener in making his home beautiful. The firm has a world-wide reputation for their seeds, and their book is a well deserving medium for their business.

We should welcome with delight another such book dealing with the hard-wooded perennial plants, shrubs, and ornamental trees.

"THE PRINCIPLES OF GARDENING FOR AUSTRALIA."

By C. Bogue-Luffmann.

This book to hand is very timely, the only surprise being that it has not appeared long before this. Australian gardening in something like a standard book-form is sadly lacking in Australia, and this artistically got up little volume, at the price of half-a-crown, published by "The Book Lovers Library" of Melbourne, is very welcome. The contents of this book are divided into chapters upon The Principles of Garden Architecture, Designing Gardens to Meet Local Conditions, Materials Available and the Practical Work of Making Garden, The Selection and Arrangement of Permanent Plants in Garden Schemes, Planning, Forming, and Maintaining Small Gardens, Garden Management, and a Rose Garden. From the foregoing it may be readily seen that Mr. Luffmann has written to some purpose, and anyone who makes a careful study of the book cannot fail to catch the inspiration of a man whose heart and soul is in his work, and who has done his best to give freely of his knowledge and valuable experience. The ideas in the book are not only eminently practical, but they have also the recommendation of being artistic. We are quite sure from this book that the author is capable of writing a great deal more, and what we now look for is another volume giving more elaborated details. He apparently does not like the idea of "books that are mere catalogues of plants and directions for managing them." Just so. But there are thousands of amateurs who would like to know something of the peculiarities of the plants that they are called upon to manage, and also the best way to manage them, and, having set out the general principles of gardening in such a fine fashion, we think Mr. Luffmann lays himself open to the task of telling us something about the things that make up the garden.

The Orchard.

THE MARVELS OF FRUIT BREEDING.

By Marcus Woodward.

[From "Pearson's Magazine."]

Sawbridgeworth—a charming, straggling, red-roofed village of Hertfordshire—is a place with a fame which its peaceful inhabitants, I imagine, little wot of. The name and the fame of this village have been carried to the uttermost ends of the earth. And, as you will agree is very right and proper, it is by its fruits that Sawbridgeworth is known.

You would pass through the village on your motor-car or bicycle and see nothing wonderful about it save its picturesqueness, common to all Hertfordshire villages —its old-world streets—its quaint houses. You would pass by it in your train from London to Cambridge, and note only the beauty of green country. But take a few steps in the right direction away from the village, and you come to a place that has done more for the improvement of fruit than can easily be described or imagined.

Here are two hundred acres of land under fruit-tree cultivation—the nurseries of the Messrs. Rivers—that have been the birth-place of some of the finest, earliest, and most luscious fruits known. In the spring-time, when the white and pink blossoms of the fruit trees are out in all their beauty, the nursery is a wonderland, and a walk through the great glass-houses, where the choicest peaches, nectarines, cherries, plums, oranges, and grapes are being hurried on to take their places as the first English fruit on the market, is a revelation as to the beauty of fruit trees grown in pots. The nurseries stretch away over miles of country, for besides fruit trees there are acres of rose-gardens that are a blaze of glory when the summer comes.

But above all, it is here where the most extensive experiments ever known for the improvements of fruit have been made. Day after day the experiments go on. Nature's occasional freaks are looked for, and eagerly seized upon when found, to be utilised for the breeding of new varieties. Marvellous and unlooked for results are gained by the crossing of different fruits. And it is these experiments, carried on by three generations of the Rivers' family, that have resulted in those marvellous peaches of the nectarine flavor, those massive cherries on tiny trees, those high-bred oranges that are in demand even in such places as the West Indies and the Cape, where orange-growing is one of the great industries of the country.

These experiments have increased the size of the peach from a circumference of six inches to a circumference of nine inches, and of the nectarine to a circumference of twelve inches, and the value of the fruit has increased proportionately.

The fascination of fruit-breeding lies in its uncertainty. It is largely chance work. The seed of a fruit, planted and cultivated, may yield fruit better, equal to, or inferior than its parent—no man knoweth beforehand what the outcome will be. One good fruit cross-bred with another may yield, in the same way, any kind of fruit, or perhaps no fruit. Thousands of seedlings may be cultivated, and one only be found an improvement on the parent trees. But the one improved seedling may be worth a fortune!

Nothing, for instance, can be more valuable to a fruit grower than fruit which ripens earlier than ordinary varieties. A promising seedling is tended with as much care as a human baby, and when at last, perhaps after years of careful trial, it is proved to mature its fruit earlier or later than any other variety, its value is beyond all reckoning. It represents, to the forward-looking fruit-grower, supposing it to be a peach tree, thousands of peaches for the market at a time when, previously, his fruit was still unripe, or all gathered. To prolong the season of any fruit, therefore, even by only a few days, is the great aim of the fruit-breeder.

By their art of cross-breeding, growers have extended the season so that special trees bear fruit for the market a fortnight after the season proper for peaches has ended, thus prolonging the season to the end of September.

The wonderful improvements which have been brought about at Sawbridgeworth in the culture of apple trees in gardens and on fruit farms are due to the discovery of the two best dwarfing stocks —the Broad-leaved and the Nonsuch-Paradise. It was chance that brought about the system of lifting and root-pruning apple trees on these stocks and the pear tree on the quince stock.

Mr. Thomas Rivers—whose grandsons are now in charge of the nurseries—had, as a boy, a famous fruit-appetite, and if a tree in the nursery planted by his grandfather, now more than a hundred years ago, could be found with superior fruit, he was a constant visitor to it.

He discovered early in his career that the trees with the best fruit were to be found in what was called the "hospital" of the nursery—a piece of ground devoted to refuse trees, which were too small for customers, and which were often taken up and replanted. Many a fine feast of ribston and golden pippins he enjoyed in the hospital—but it was not until he came to a thinking age that he realised why these refuse trees never made strong shoots, and yet bore grand crops.

The reason was simply because they were often moved, and the ground round about them was often dug over. Understanding this, he began to introduce a new system of fruit-cultivation in the old nursery—that of making the trees fruitful and healthy by keeping their roots near the surface, pruning them frequently, and moving the trees, if necessary, once in about two years. In this way the trees are kept dwarf, and great crops are produced.

And great changes were made in the shape and size of fruit trees. In old-fashioned orchards trees are allowed to grow to whatever size and in whatever shape they will, and the grass is allowed to grow beneath them, as food, it may be, for cattle. But now the orchards are orchards in miniature—condensed orchards —with trees only a few feet in height, and generally either pyramidal in shape, or like little bushes, and the ground beneath them is carefully cultivated.

An apple orchard of one acre planted with dwarf trees will contain more than five hundred trees, shaped either as broad little bushes, or as regular pyramids; and there will be space for some seven hundred smaller bush fruits between the trees. Profits may be expected after about three years, and will continue to be made in an ascending scale for twenty years. The effect on the fruit trade that has been wrought by such revolutionising ideas cannot be calculated. And then the little bush or pyramidal trees make very fine ornaments for lawns or gardens.

But still more interesting is the method of growing fruit trees in pots, as ornaments to greenhouses. The trees, with their beautiful foliage and fruit, are as decorative as any exotic flower, and would be well worth growing for their beauty alone, even if their fruit were uneatable. In the gardens at Sawbridgeworth, small orchards are grown in pots under glass—orchards of peaches, nectarines, cherries, and plums, while pears are grown in pots in simple span-roofed orchard houses, without artificial heat.

It is on these prolific little fruit trees in pots in the great glass-houses that the fruit-breeding experiments are carried out. There is no end to the varieties which may be produced by crossing different kinds of fruits; but one might make a thousand crosses without finding any improvement. Hence the greatest skill, judgment, and knowledge must be brought to bear if any remarkable results are to be gained. To produce a new fruit which has no particular advantage over existing fruits, to give it a name of its own, and put it on the market, is only to add to the confusion of the already over-stocked nurseryman's catalogue.

Already there are more than five hundred different standard kinds of apples in the English market, and more than eight hundred different kinds of pears!

The greatest triumphs in fruit improvement have been with peaches and nectarines. Out of about fifty standard varieties of peaches now on the market thirty were raised at Sawbridgeworth, and twenty of the twenty-four standard varieties of nectarines. Peaches and nectarines, being of the same species, cross well together. A peach no doubt often improves the size of a nectarine, while a nectarine flavor often improves a peach.

The method of crossing two fruits is simplicity itself. The horticulturist merely takes the pollen from the flower of one specimen, and dusts it into the stigma of the flower of another specimen. The result is a hybrid, for better or for worse.

Of course the experiment is not made quite at haphazard, without a certain knowledge of Nature's mysterious ways and laws of production. There is a story of a man who thought he would produce some marvellous new fruit or flower, he dared not think what, by collecting the pollen of his garden flowers, and dusting it upon the flowers of his apple tree! But there is a limit even to fruit-breeding.

Supposing that it is desired to cross the latest and most luscious peach with the most luscious nectarine.

Two or three of the good shoots will be selected for the experiment on the tree that is to be the seed parent, at the time when the bloom buds are beginning to show color.

As soon as the pleats are open, the anthers are removed in order that self-fertilization may not be effected, and the pistils, the female organs of the flower which are to be fructified, are left clearly exposed.

The flowers are at once isolated in muslin bags, so that no buzzing bee or officious insect shall visit them, and perhaps anticipate the work that is to be done.

All things thus made ready, the operator collects the pollen with a camel's hair brush from the flowers of the other parents, and with the merest touch applies it to the pistils of the prepared blossoms one after the other.

In course of time the flowers thus fertilised bear their fruit. The fruits are plucked and the seeds gathered with great care, to be sown in the autumn. In the spring seedlings grow up, and from their first appearance the closest watch is kept on their habits.

Long before the seedlings grow old enough to bear blooms, the trained eye of the horticulturist may discover that the plants have inherited some special trait from one or the other of their parents, or, it may be, there are signs of some new trait that both the parents lacked, yet inherited from some remote ancestor. Five years—possibly ten years—must pass before there can be any certainty. Then, one spring, at last the seedlings themselves bear fruit.

(To be Continued)

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RINGING THE CURRANT VINE IN GREECE.

By F. B. Wood (British Consul at Patras).

Patras is now the centre of the currant trade, and what you call Zante currants are produced in large quantities throughout most districts of the Peloponnesus. The total average annual produce is now about 160,000 tons, and of these about 140,000 are grown in this Consular district, and only about 20,000 in the Islands of Zante and Cephalonia. The practice of cincturing or ring-barking the currant plant (ring-cutting it is called in this country) dates back about 50 years, and was first introduced to combat the effects of the oidium blight. In 1852 the entire crop of currants was attacked by this malady, and almost completely destroyed. No remedy was discovered, and the 1853 and 1854 crops suffered equally. In 1855 the sulphur remedy was successfully applied, i.e., sulphur in fine powder sprinkled over the vines with bellows two or three times during the early stages of growth in the spring. The malady was arrested, but the plants, evidently suffering from the effects of this three years' visitation, were much weakened, and only bore very small berried and shrivelled fruit. Some growers, at the instigation, no doubt, of some agricultural school, first attempted ring cutting in 1855—with satisfactory results—the fruit attained much greater development, and when dried the berry was almost double the size of the unring-cut produce. The bold currants gradually grew into favor in most markets, and during the course of the last 50 years the entire currant crop, one may say, is annually subjected to this process. Only in Zante and Cephalonia do they still grow a few hundred tons of unring-cut currants, as they are called in trade.

PROCESS UNNATURAL.

The process is, of course, anomalous and unnatural, and has proved very detrimental to the vitality of the currant vine, and to the keeping quality of the dried currant. It is very difficult to give accurate figures and statistics in reference to a growth which has really only been under careful scientific observation for the last 30 years; but it is traditionally reported and believed, that the currant vine, before ring-cutting was resorted to, retained its full vitality and full bearing power for a century and more; whereas the present plants begin to show signs of decay after 30 or 40 years. Ring-cut currants, although much bolder than unring-cut produce, are not nearly so sweet, and also lose their aromatic flavor and smell to a great extent. The skin of the berry also, which in the unring-cut currant is very thin and velvety to the touch, becomes coarse and hard to the touch and taste.

FRUIT UNMERCHANTABLE.

It is an axiom with currants that the more saccharine matter they contain the better they are in appearance, flavor, touch, and keeping quality. The unring-cut currant, before 1852, used to keep perfectly sound and sweet for ten years or more, whereas the ring-cut fruit begins to fall off after the first year, and is generally unmerchantable after the third season.

ONCE RUNG ALWAYS RUNG.

It may be pertinently asked why the ring-cutting is persisted in, considering its baneful results to plant and produce; but the answer is that when the system has been once adopted it can no longer be abandoned, without total loss of crop for some years, and this no grower in the country can afford. It must also be observed that the weight produced per acre by ring-cutting is almost double that of unring-cut plants, and this is a compensating advantage which no doubt accounts for the fact that even new plantations are subjected to ring-cutting. Some growers have informed me that cutting and slips have acquired a hereditary liking to ring-cutting, and that it is doubtful if they would produce without it; but I do not credit this. The ring-cutting is done in this country a few days after the fruit has set, and mostly on the main stem—in some districts it is done on each minor stem, and this, it is said, is less detrimental to the plant. The Peronospora malady which did such wholesale damage to the currant crop in 1900, is now successfully combated, by spraying the vines with a solution, 1½ to 2 per cent. of sulphate of copper, 1 per cent. slaked lime and water.—"Journal of Agriculture," Victoria.

SOUTH AUSTRALIAN GRASSES.

By J. G. O. Tepper, F.L.S.

The grasses form a large order, distributed over the whole habitable earth, and are so uniform in structure of the reproductory organs and aspect, that but few other orders at all compare with it. In point of fact the Gramineae or Grasses furnish perhaps the greatest number of individuals of any, not even excepting forest trees, for they actually clothe immense areas almost alone, and still larger ones partially, very few parts of the earth being destitute of meadows of some sort. Moreover, grasses furnish man and his proteges, the domestic animals, with by far the largest amount of food, for wheat, barley, oats, rye, millet, sugarcane, &c., are all members of the order, though many persons would scarcely rank the above-named as such. All are more or less social in habit, but by far the largest number are humbled in size, varying from a few inches to some feet in height, but some attain to the size of trees, reaching in the case of some bamboos an elevation of from 20 to 120 feet, and yield excellent material for light buildings and other purposes, for which timber otherwise is usually employed. No bamboos appear to be indigenous to Australia proper, although just beyond the narrow arm of the sea, known as Torres Straits, they are found in abundance.

The grasses approach in aspect and habit very much some other orders, viz., the Restiaceæ, or Rush Sedges, and the Cyperaceæ, or true Sedges. The former are allied to the Juncaceæ, or real Rushes, but have the floral organs much reduced, while they differ from the Sedges by having their leaf-sheaths slit like grasses, and other characters.

The Sedges, on the other hand, differ from grasses by having the leaf-sheaths closed like a cylinder, have solid stems, or stalks, quite a different floral arrangement, and are usually hard and rigid, which unfits them largely as proper food for animals.

Grasses are more or less tufted in habit, that is, during the process of growth more and more branches start at the base, just above the roots, which remain connected together, though each may emit roots of its own, so that when forcibly separated they not only continue to grow, but each becomes a new centre of growth. This is one of the reasons why they form close lawns and bind the surface into a dense turf under favorable conditions. The roots are simple, or but little branched, and as they appear without any definite order are said to be adventitious. Some species emit root-like underground stems from which new plants spring, as the Couch-grass, *Cynodum dactylon*; others produce knotty stems above the ground, from every knot of which roots spring when touching the ground, originating as many independent plants when becoming separated, like the Buffalo-grass.

Some of the grasses last many years; in fact, various species are almost indestructible by sheer vigor of growth, but others only last one season if allowed to bear seed, dying immediately after maturing their fruit, like the cereals, the Silver, Barley, and Brome Grasses. Between these stand the remainder, whose leaves and stalks die down to the ground annually, but fresh foliage springs from the rootstock after the first rains. Most of the South Australian native species belong to the last category.

The leaves of grasses are usually many times longer than wide, varying from filiform or thread-like to lancet-shaped. At the base they are fixed by their whole width to long sheaths, which spring from one of the knots, clasp the stem, and are slit on the opposite side to the blade, which has parallel veins and tapers gradually to a point. The stems or stalks are more or less hollow and interrupted by swellings or knots, which are solid. The surface is smooth or finely furrowed, and often very hard, which arises from the formation of more or less microscopical plates of pure silica (flint-like substance), which possess a regular form, and differ in the various kinds. The quicker and more luxurious a grass grows, the fewer of these plates are formed, consequently the richer the soil the softer are the tissues, while on poor sandy soil the contrary is the case. The office of these plates is to act as an armor for protection against the attack of moulds and rusts, hence those kinds like the highly-cultivated wheat, which have an inefficient supply, are far more liable to destruction by parasites than the harder kinds.

The fruiting organs of grasses form always a spike, the parts of which are called spikelets, and which are either sessile, and form an ear, or are raised upon longer or shorter stalklets or pedicels, which again are either simple—that is, bear but one fruiting spikelet—or are branched, or compound, and bear several. The part of the stem bearing the fruits is called the rhachis, and it, or its parts, is either attached permanently to the lower part, or is articulated or jointed with it. In the former case the seed falls out alone at the time of maturity; in the latter it remains attached to the spikelet, and falls away with it.

Grasses have no flowers in the sense of those of a marigold or a lily, being destitute of calyx and carolla, but only develop stamens (the male element) and pistils (the female organ). Of the former there are usually three, which become reduced to two or one with some, or augmented to more than three with others. The spikelet, which is the fruiting unit, is composed of the central axis or rhachis, glumes, palea, and lodiculi, besides the sexual and essential parts.

The rhachis either ends at the base of the spikelet or extends beyond it in the form of a bristle. The glumes occur in several pairs; they are green or pale, more or less stiff bracts, the first two, or sometimes three or only one, at the base, and one or more at the top being empty. The lower empty glumes invest a pair of paler-tinted, half-transparent, two-nerved bracteoles; these are the palea, which enclose the stamens and pistils, at the base of which some two or three minute scales are often (not always) found, viz., the Lodiculi, representing the floral envelopes of higher orders. The anthers of the stamens are two-celled, burst lengthwise, and produce dry pollen grains in great quantity, which is wafted by the wind upon the stigmas of other plants of the same species. Of pistils there are usually two or three, sometimes free to the base, at others partly adherent. The stigmatic or sensitive surface is long and narrow, and frequently in the form of feathers. The stamens either protrude at the top or by the side, the pistil usually at the top of the spikelet. The ovary is entire, and one-celled, bearing one ovule only. The real fruit is a nut mostly inseparably fixed to the seed or germ at the base, and sometimes also, as in barley, to the palea. The seed itself is erect, and contains much albumen.

Some grasses are bisexual, others unisexual—that is, the stamens appear alone on some spikelets, while the pistils occupy others.

Baron Ferd v. Mueller, the great Australian botanist, enumerates 346 species of Gramineae as indigenous to Australia (to which, since the first appearance of the census, a number have been added), the order thus occupying sixth place in respect of number. By far the greater number of these belong to genera which are either cosmopolitan or are represented elsewhere, and only a comparatively small proportion is wholly restricted to this continent.

In subsequent numbers those found more or less prominently in the southern parts of this province will be treated, and their habits, properties, &c., described as far as is known to the writer.

(To be continued.)

"PERMANENT AND TEMPORARY PASTURES."

By Martin J. Sutton, F.L.S.

From Messrs. Sutton & Sons, Royal seed merchants, of Reading, England, we have received a copy of the sixth edition of Mr. Martin Sutton's book upon pastures. The book is a welcome contribution to horticultural literature. It contains the two elements that go to make a book worth studying—descriptive and practical. From the descriptive element people in Australia will understand the characteristics and virtues of grasses that make good pastures in the colder and wetter northern hemispheres, and from the practical cultivation element it can easily be seen how to apply those virtues to our varying conditions. For these reasons we hope the book will find a place in many Australian gardens and farms. We, as a people, are much too slow to appreciate the value of English grasses, and this fact is all the more surprising, because of the trying conditions of our long hot summer months. As a matter of fact, nearly all the best grasses under cultivation in Australia come from England, but the pastures are comparatively so few. This is not because they cannot be adopted to our climatic conditions, but because our cultivators do not appreciate their value. Occasionally we read of country and suburban lands for sale, one of the chief recommendations to the purchaser being that the pastures are laid out with Englishes grasses. Instead of this being the exception it should be a recognised rule to put every available acre of ground under permanent grass, when not needed for greater profit. The book under notice opens with a few figures regarding pasture lands in England. It is not always good policy for an author to risk an opening chapter with anything approaching statistics. The average reader as a rule prefers to be led unwittingly on to statistical ground, but to plunge him in head first is liable to give him a mouthful, which, if it does not choke him off, leaves an unpleasant taste. The risk, however, in this case is not great, if any, because the figures are judiciously placed by way of illustration, and contain surprising facts. For instance, few people in Australia can realise how a country having 24 million acres under cultivation, can afford to retain over 13 millions of the area under permanent grass. The figures go to show that the arable land is fast giving way to grass land. The author ascribes this in measure to the difficulty of obtaining efficient and remunerative labour. The experience in England, as elsewhere, is that the rural population drift into city life, where there is greater activity and variation of interests. All drawbacks to city life, which the countryman cannot understand, count for nothing against man's gregarious inctinct. The farmer, then, is left without labour, and dependent upon machinery. It is freely admitted that the creation of pastures is bad for the nation, because land does not produce so much food as when under the plough and spade, and gives less employment. But the author very sensibly remarks also that the question which agriculturalists have to consider is neither the most productive method of cultivating land, nor the system which will employ the largest number of labourers, but the most certain way of farming land to avoid loss. This chapter upon the extension of pastures is entirely sensible, does the author credit, and should be read by all producers. He advocates what he terms "temporary pastures," meaning artificial grasses, in two or four year rotations, and goes on to quote the commercial aspect of dairying, and the words of an authority who has declared that "a ton of milk is worth more than a ton of wheat, and costs less to produce." Not a few producers will be surprised at this, for the simple reason that it had never occurred to them to make the comparison. It is a fact, nevertheless, but will not hold good in Australia under present conditions of feeding cows. The ABC of all Australian problems in production is water. Given a sufficiency of this and there is no country in the world to compare with its power of production. Our English friends find it difficult to believe that miles of country as bare, as sandy, and as rocky as a macadamised road, and just as destitute of vegetation on a given date will, with an inch of rain, or less, within the space of a week produce waving stretches of grass a foot to eighteen inches in height. But such is the producing power of our arid northern regions. Water is the secret of our wealth. What we want is a grass that will stand conditions of drought. There seems to be little doubt but that wheat has the greatest resisting power over drought, but all the grasses described in Mr. Sutton's book we are confident could be grown profitably as pastures in our southern country lands. Also in many of the valley stretches in our numerous hills everywhere in the country.

After giving a series of chapters on practical cultivation in the field, a long descriptive list is given of suitable pasture grasses. Then follow the clovers, and sundry plants for grazing, feeding, and haymaking. A very thoughtful and most useful set of notes is upon worthless, injurious, and poisonous plants. Before we come to the final pages of a most complete index, is a series of splendidly illustrated botanical descriptive plates, and analyses of grasses and clovers.

The book is got up in the best style of printer's art, and, we repeat, a welcome and valuable addition to horticultural literature.

Vegetable Garden.

OPERATIONS FOR DECEMBER.

Silver Beet.—This is a good useful vegetable for the summer; but, like all vegetables which are grown for their succulent leaves, it needs a good deal of moisture. When preparing land for this beet, apply a heavy dressing of rich farmyard manure. Sow or plant in rows about 20 inches apart. The plants should stand about 18 inches apart in the rows.

Broccoli.—In the quite cool districts a little seed might be sown occasionally, and when the seedlings are large enough to move they had better be pricked out 4 or 5 inches or so apart. Afterwards they should be shifted again to good, rich, well-manured ground, and planted out about from 3 to 4 feet apart. During the moving operations as little damage as possible to the roots should be caused.

Cabbage.—A few young cabbages should be planted occasionally from the bed where they have been already pricked out. Sow a few more seeds. There is no necessity to sow much more than will be necessary to provide enough cabbages for successional planting, allowing for some loss. The variety called Succession is an excellent one. Another named Phenomenal is also a superb variety. I sent a few seeds to Mr. T. F. Ellis, Superintendent of the Howlong Viticultural Station, last season, and the cabbages he raised there have been splendid. He says, "As I have raised and given a trial to two separate batches from the same packet of seed, the first batch of which you saw; the second lot has also proved to be first-class. I am sowing some of the first for seed, and I hope to have a good lot from them. It is an ideal cabbage, and I do not think it possible to produce a better." Plant out any good seedlings of cabbage which may be ready, and take the precaution to use abundance of manure.

Capsicum or Chili, sometimes known as Pepper.—A few plants only need be grown unless for experiment or ornament, for some of the variety such as Celestial are very pretty when covered with the various-colored fruits. Some of the large-fruited mild varieties, which are said to be the best kinds for the use of canaries, are quite handsome with their brilliant-colored fruits. Sow a pinch or two of seed.

Egg Plant.—Not much used in this State as a vegetable. A few fine fruits are occasionally imported from New Caledonia, but they could be grown here just as well as in that country. There are many varieties, some with white, others with striped, some bright scarlet, and others again with purple fruits, but the merits of these for vegetable purposes are much the same. Sow the seed in a box or flower-pot, or in seed bed, and transplant in well-manured land. Set the seedlings about 3 or 4 feet apart.

Khol Rabi.—Useful for stock, and occasionally used and liked by some persons as a vegetable. Sow seed, transplant, and manage just as you would for cabbage, but the plants need not be planted quite so far apart, if to be used as a vegetable, for they had better be cut when rather small and tender.

Leek.—A few leeks will be found useful for a change vegetable; and for many kitchen uses. Seed may be sown from time to time in box or seed bed, to keep up a supply of young leeks for planting out. Any leeks already raised should be planted out in trenches made from 4 to 6 inches deep. There is no real necessity for planting in trenches, but as the leek needs a great deal of moisture during its growth, and is benefited by applications of water and liquid manure, the shallow trenches will be found convenient. Before planting dig the soil well and apply manure heavily.

Parsnip.—Sow a little seed in rows 2 feet apart. The soil should be deeply dug for this vegetable, and no manure should be applied directly; but it should grow well on land that had been heavily manured for cabbage, cauliflower, or some such crop. The parsnip takes a long time to come to maturity, but is worth growing, for it is a wholesome vegetable.

Turnip.—Sow a little seed.

Vegetable Marrow and Squash.—Sow as extensively as may be required. The bush marrow will be found of much value in small gardens, and can be recommended.

Onion.—Sow a little seed, and attend to onions which are making progress; keep down the weeds, and cultivate between the plants frequently.

Potato.—Plant out a few rows in cool climate districts. Use manure freely, and be careful not to plant unsound or scabby potatoes.

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The Flower Garden

OPERATIONS FOR JANUARY.

The month of December was so unlike the usual Australian summer weather that the preparations of gardeners may almost be repeated with success for January. It was more like winter than summer without the cold. Thus it happens that gardeners may go on planting out summer annuals and the perennials, but with some regard to the fact that spells of heat will come upon them quickly. In this the tender plants will require some nursing, careful attention being paid to mulching, watering, and shading. We hear a number of amateurs sighing over their annuals and giving up with a declaration that they will have no more of them. They are too much bother. But we would still advise them not to neglect the opportunities of making their gardens gay, and with a little patience and perseverance will succeed with that beauteous floral reward that always comes with multicolored variation and brightness during the summer months. Far more brilliant effects can be obtained during summer than in winter. It is Nature's compensation for the trying heat. A brightly blooming garden cheers the heat-belated worker, while on the other hand, a miserable, neglected, surrounding of death and weeds has but the effect of making the general conditions harder to bear. The cooling effect of a nicely-kept lawn, bordered with bright blooms is worth working for, as anyone can testify who walks out of a hot street into such conditions of neatness, coolness, and beauty. We were very much struck with an article we read in "The Gardener" upon how to bed out a garden, and the effect should be worth striving for. It is artistic and easy to accomplish with a little effort. The weather up to the present has been so phenomenally mild in temperature that it might be attempted even so late. Evidently intended for spring operations, our summer has hardly begun, so that spring conditions may be said to prevail, and those who are practical enough in the art of gardening will readily be able to adapt the suggestions to their conditions of climate and general surroundings.

When beds are to be filled, upon a lawn for instance, or in the all-important front of the house, the gardener should make up his mind first whether he is prepared to take more trouble as the weeks pass by, or whether the one planting is to be the last this summer and autumn.

A pretty permanent bed is to be made by alternating Fuchsias and scarlet Verbenas, Heliotropes, and pink Ivy-leaved Geraniums, white Marguerites and double scarlet, pink, or salmon Geraniums, or yellow Marguerites and blue Verbenas. A bed of white Verbenas with some Cannas in it, one of yellow Violas and Heliotropes, of Fuchsias and Chilian Beet, of French Marigolds and Caladiums, and African Marigolds. Stocks and Asters, Cornflowers and Godetias, on the contrary, with many other bedding plants, the names of which will readily occur to memory, will pass through their best period and become more or less unsightly. These should only be used, therefore, where the gardener does not desire permanent beauty, or where he is willing to introduce other plants during summer.

A bed of white Violas and rose pink tall Peony-flowered or incurved Asters is a very pretty sight in summer, but when the Asters' glory is departed they should be lifted, and budding dwarf Michaelmas Daisies be slipped into their places. This can be done without in the least injuring the latter.

A bed of purple Stocks surrounding a centre of miniature Sunflowers is a favorite scheme of mine, but the Stocks are past their prime early, whereas the Helianthus go on as late as possible. What is the remedy for this evil? Why, to put out, in the Stocks' place, some young pot plants of flowering white or yellow dwarf Chrysanthemum.

Starting from early spring, a bed may be of Hepaticas, Winter Aconite, yellow Tulips, and golden Wallflowers; when the two first are over let them be replaced by purple Pansies; these, when they look sorry for themselves in hot summer, can be followed by purple Verbenas, and the Wallflowers must give way to Calceolarias or African Marigolds (lemon).

Of course, beds that lie near windows should be kept so that they always look well; and these should harmonise in color with any flowers in the window boxes. If the latter are gay with pink Ivy-leaved Geraniums, for example, do not have a display of orange or scarlet flowers in the beds beneath.

In a new garden it is often desirable to shut out ugly corners, or make screens in places. To do this with annuals is quite possible. Tall Sunflowers grow up very fast, Convolvuluses and Nasturtiums, Canary Creeper, and Sweet Peas on a lattice formed of string criss-crossed between poles, will soon prevent much view being gained through them. They can, of course, be supported on a hedge of faggots, if preferred. A mass of single and Cactus Dahlias is useful, too, or of early raised Hollyhocks, or the 3-feet high strain of Antirrhinum giganteum.

There are Michaelmas Daisies 5 feet high. Atriplex Hortensis atrosanguinea is a valuable 4 feet high plant, quite a hardy annual, with red foliage that turns to deep purple. The graceful feathery, vivid green Artemisia annua grows quite tall in good soil. Then is there not the annual giant Hemp, Cannabis gigantea, an 8-footer? The summer Gourds grown on a light, rough, rustic wood trellis (that any man can knock up by sticking branches deeply in the ground, slanting them one across another, and binding them together with tarred string) will make a most interesting screen. So, by-the-bye, will the Runner Bean, Painted Lady, or the Climbing Cucumber.

I think one of the best of annual Sunflowers is Helianthus giganteus, Russian Giant.

Too many brilliant colors in the beds should be avoided, even when they are scattered over a large lawn or flat of the garden; if they cannot all be seen at once from any important point of view of course the gorgeousness of hues will not matter. The eye gets tired of too much gaiety, just as the mind does. An all white bed often comes as a welcome relief to sight. So would an all green one, which I doubt if we shall ever witness. Yet there are plenty of charming green foliage plants of various shades. Palms can be bedded out, large and small, among mossy Saxifrages that finish blooming early, or have insignificant florescence; other plants, such as Geraniums, can even be kept from spoiling the grateful green by blossoming. Artemisia annua will be very useful here.

Then why not a bed of green and white variegated foliage—one of all silver green, made up of such things as Pinks (whose white bloom will soon be past), Cerastiums, Cineraria maritima, Grasses, Eucalyptus plants, Zeas, Saxifraga cochlearis, Pyrethrum cinerarie-folium, and Chamepeuce diacantha? Why not a brown or crimson foliage bed now and again? There are plenty of plants suitable for all ranks in it.

Then who would not admire a bed of golden foliage, in which Thymes, Sedums, and variegated Abutilons might thrive, as well as plenty more yellow and white leaved plants that either do not bloom noticeably, or have yellowish flowers.—M. HAWTHORNE.

PITFALLS OF THE NOVICE.

The greenhouse or conservatory holds an important place in the economy of the garden. It supplies, or ought to supply, the house with flowering plants, and should itself be, during most of the year, the home of a fair number of flowering subjects. Many a beginner in the art of gardening first experiences bitter defeat where the treatment of these pot plants is concerned. The novice is able to take all needful care of his or her plants before and during their flowering period, but directly the time comes for them to be cut back and prepared for future use, the inexperienced gardener is filled with misgivings, and does not know how to proceed.

The sooner the novice grasps the why and the wherefore of this shortening back of all growth after flowering, the sooner will he lose his timidity in using the knife. Old wood does not branch freely, while if it be cut back bushy growth is induced, and much new material is formed to bear flowers in the future.

I should have hesitated to enlarge on this simple matter, embracing as it does, one of the first principles of gardening, if a very enthusiastic beginner had not begged for guidance. "The majority of writers on gardening matters presuppose that their readers know too much. A few simple and definite directions interspersed amid the reading matter for those who have advanced farther along the road to knowledge would be very acceptable to the real beginner," this novice said thoughtfully, and added, "Write an article that presupposes the crassest ignorance, and it will be most useful." This, then, is my excuse for writing of so simple a matter.

This timidity on the part of the novice was strikingly exhibited the other day. I stepped on the border, and, without asking permission, cut off a Brier that was growing up from a Rose tree, and was, in fact, taller than the Rose itself. Explanations followed, but the poor novice was with difficulty convinced that it could be the best thing for the tree in question to cut away so large a portion.

The same thing virtually occurs when sowing seed. The beginner invariably sows the seed too thickly, and with the greatest reluctance thins out a few of the seedlings when told that the whole patch will be ruined if left as they are. To expect a proper thinning at the hands of the absolute novice is hopeless. But I have heard an experienced gardener confess that he also went through this phase, and thought that it was the same with nine out of ten amateurs, and, therefore, that none need despair.

BUDDING ROSES.

To me the most interesting gardening operation in summer is Rose budding. It is a pity lady amateurs do not attempt the art of budding. Their fingers are light and deft, while their natural expectancy would ensure success. Many amateurs would like to know whether it is best to get a bud into a lively condition at once, or whether "dormancy" is the best policy. Many argue that the finest blooms are cut from "dormant" buds, and that they stand the winter better. My long experience sides for "dormancy." Then, why will buds remain dormant two years, then break out and make beautiful heads? These "liers in wait" seldom send up a single stem, but always proceed to bushiness at once. Last year I budded a stock in the orthodox style, but as every bud failed I budded again in an unorthodox manner by inserting a bud of a strong growing variety above the place where the previous bud had been, resulting in a most promising head. Has anyone tried this?—R. E.

ODD PLANTS IN WINDOWS.

One has to be careful when conversing with lady window gardeners, even if one is a professional. It is surprising what a cottager can and will grow in a window. She will cultivate Alpine Auriculas, and get them to flower, too. Her Zonals may be poor varieties and resemble Jacob's ladders, yet they are rarely out of bloom. She will crowd a dozen plants in a space only large enough for three, yet present a brilliant show from outside. An item which startled me was a Doronicum in full bloom in a front window in mid March. She can show Chrysanthemums in January—even February, in fact. I saw some very good blooms of W. H. Lincoln as late as the 20th of the latter month. True, the plant was inelegant enough, but the flowers were there.—T. A. W.

A SUBURBAN MYSTERY—CHEAP LAVENDER PLANTS.

For some time recently men have been hawking cartloads of Lavender plants in the suburbs of London. The plants are about 18 inches to 2 feet high, and as far through, and are grown as standards generally, with a main stem as thick as one's thumb. Housewives in Suburbia have bought them with avidity, and many of them now adorn front room windows in 6-inch pots. As they are sold for 2d. each, one wonders if they have been stolen; or is it the practice to throw away old plants from the Lavender fields in spring? I should be glad if any reader with knowledge of the subject would enlighten me, for I am sure that the plants are not grown to sell at the price.—REGIS.

THE RESIDENCE OF DR. E. LESLIE POOLER, STIRLING WEST.

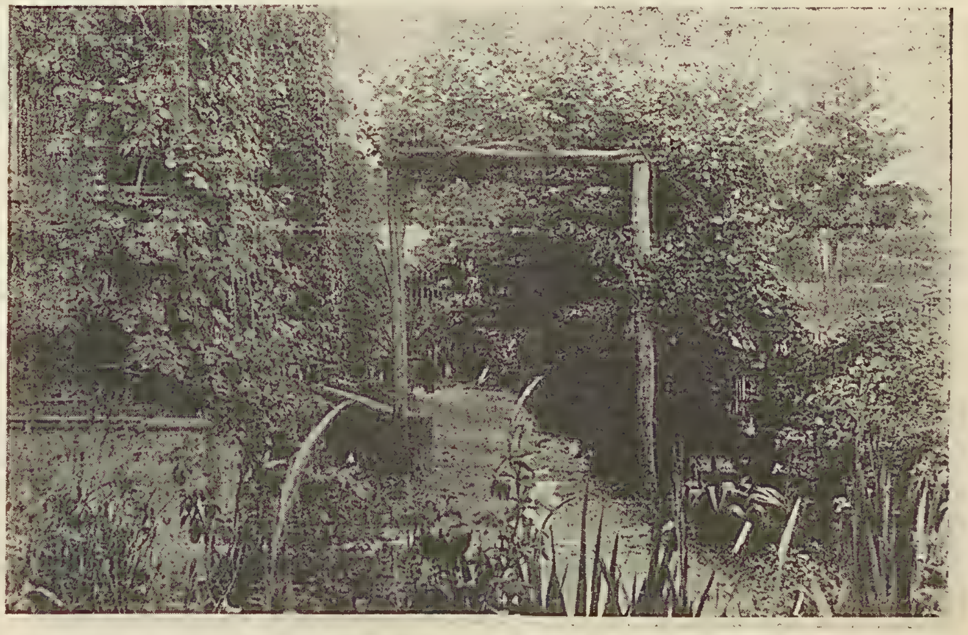
The residence of Dr. Pooler is on a professional site, as the nature of his calling demands. On the main road to Adelaide he has for immediate neighbors the Salvation Army Barracks, so that the material and spiritual welfare of those who require to visit him professionally can be conveniently attended, if so desired. Not that there is anything specially in common between the doctor and the Army captain, but the possibility of united effort for the well-being of patients ailing in body and soul is there if needed. The Salvation Barracks is a part of the old establishment of Hill & Co.'s stables, so well known before the railway in the old coaching days by travellers to Mount Barker and Strathalbyn. Here the travellers rested at what was known as the "Half Way," and a great sight it was to see the five-in-hand coaches towering away up with their loads of people and baggage, come spanking down the hill and draw up at the hotel. It was a busy time for everybody, not the least excited being the local villagers who were wont to gather round. All this is now transferred to the more prosaic and modern railway station, and the road maintains a more comfortable, easy-going traffic. The strains of Salvation now take the place of the less saintly declamations of coach-drivers, ostlers, stablemen and boys, weary travellers, and those who have to deal with horses.

The next neighbors to the Barracks are the Post and Telegraph Office authorities and the Police Station, each of which carries records of equal interest to the other, and near by is the Half-Way House Hotel. All within a stone's throw of each other, and all brimful of traditional stories.

In such a position the doctor has necessarily a limited area of garden, about three-quarters of an acre, but we are willing to express the opinion that, leaving out the portion covered by his pretty villa residence and the prescribed limits of a backyard and stabling, the balance of the ground carries a greater burden of choice garden beauties than any place that has come under our observation. It is a perfect little study in garden economy and scientific culture. As one walks quietly round the little plots the visitor becomes intensely interested. He cannot help it. Everything is so choice, so effective, so highly cultured, and yet so delightfully simple. The doctor delights in telling his visitors everything they want to know, and would tell them everything he knows if it were possible. After an hour the visitor feels that he is on the highway to a liberal education in the art of growing the most lovely flowers. He criticises everything, and spares nothing in his efforts at getting perfection. His specialities are Roses, Carnations, and Gladioli, and, although he delights in all other flowers, they do not claim much of his attention, while trees and shrubs are simply that and nothing more to him. What he does not know about Roses cannot be found in any ordinary book. He does not profess to know much, and would blush at being called anything but a humble amateur, yet somehow he carried off several coveted prizes at the Mount Lofty Gardeners' Association Rose Show last year. All the work is done by a staff of two head gardeners and a lad—that is, the doctor, his wife, and Master Wilfred Ashenden. Regarding the lad the doctor says he could not possibly keep the garden as it is without his assistance—a good testimonial. Regarding Mrs. Pooler, of course, he has no testimonial to offer, but the visitor need not spend more than five minutes in the company of the lady to learn that her better half has by no means a monopoly of learning. What one does not know the other does, and therein lies the secret of the whole business.

We try as far as possible not to introduce personalities, but where a garden is so palpably invested with the detail work of the gardeners, and the results are not bought from the brains of professional nurserymen, with all their additional knowledge of Nature's wily ways, we find it extremely difficult to separate the man from the product of his hand, heart, and brains. The visitor can trace the master hand in almost every flower that blooms in this garden, and it would only require a small percentage of imagination to see the doctor transmuted into a sprite, entering the secret recesses of the flowers, and gleaning knowledge therein that is hidden from ordinary mortals.

But we must give our readers some idea of what is to be seen in the garden in the hope that they may learn something. The garden is practically hidden from the view of passers-by. The front is sheltered, not with an idea to prevent observation, but for shelter, by large growths of Laurel, Lauristinus, Viburnum opulus, and Weigela rosea. The paling fence is covered with Austrian brier, Monthly Rose, Gloire de Dijon, and Lamarque. Then Hawthorns tower up, and variegated Honeysuckle completes the frontage of the public footpath. Entering the gate we pass under a double archway, one leading up to the steps of the verandah, and the other into the southern and main portion of the garden. The arches are formed of a lovely Cloth of Gold Rose, whose butt measures 12½ inches in circumference, and upon its 16 years of age carries the most beautiful blossoms. The front elevation of the villa is adorned with Ampelopsis Veitchii and White Jessamine, and the verandah is beautified with climbing Marie Henriette and E. Veyrat Hermanos Roses. A peep into the verandah shows some charming Lilium Lancifolium revoluta. There is also a large wooden vevoluta. There is also a large wooden case covered with glass, containing "nothing," and as we are not interested in "nothing," we pass it by without further question, suspicious, however, that the doctor has not much room for "nothing." Passing by the pillar that ornaments the steps up to the verandah, a hand, coming into contact with something of a vicious nature, makes us aware of a vigorous specimen of the Cactus tribe, one of the Cereus family. This family received the doctor's attention while living in a region where nothing else would grow. The narrow bordering next the front wall of the house is planted with red Zinnias on one side of the entrance and white on the other. The small angular corner of the garden on the north side of the house is laid out with an oblong bed of questionable shape, and bordering next the fence. In the centre bed we find some rare beauties of Roses in Sunrise, Ben Cant (new this season, and looking well), Mad. Abel Chatenay, and Killarney, amongst a number of others. Attention is also arrested by a beautiful Sweet Pea, Mrs. Walter Wright, her first appearance in South Australia, Eckford, 1902. And such charming Gladioli. Named, but not yet published; too good to be thrown upon the public in their first year. Certainly the finest blooms we have seen, and carefully robbed of their stamens to thwart the busy bee that has no sense of judgment in cross fertilization. A



Dr. Pooler's Residence, Side View of Front Entrance.

number of Gladioli are hereabout, those that come up to standard will be carefully preserved, and the rest will be placed upon the heap. It is purely a case of "the survival of the fittest" here. In a corner we note the splendid old favorite La France, and the much-admired Mildred Grant. The fence carries Reine Marie Henriette, Bouquet d'or, and Homere, and the west winds are broken by a trellis of Passion fruit, to shelter some good spikes of Delphiniums. There are many other treasures here, and we leave with a glance at Reine Olga, Mad. Lambard, and William Allen Richardson, each doing their special duty of beautifying the place.

Passing along the front of the house to the southern side garden there is pointed out a yellow sport from Kaiserin Augusta Victoria, named Perle Von Godesberg, but it would take a keen eye to note any difference between the two Roses. Hard by is a good plant of Soleil d'or, which is a cross between an Austrian Briar and an H.P. This is spoken of as a marvellous Rose, and keeps company with the gold medal prizetaker, Bessie Brown. This little garden carries some aristocrats of the floral world, and overlooking them from the side wall of the house are Reine Olga and Mad. Leonie Viennot, looking rare in her salmon with red edging of decoration. Both of these are prizetakers, as also is a little Shandon, who stands near by Robert Scott, a 1901 American Rose of good breeding, from the illustrious parents, Mrs. W. J. Grant and Merveille de Lyon. This was brought out by Dickson, favorably noticed for its silvery pink shading and fine fulness of bloom right into the centre, and has no coarseness which the English critics spoke of in its own home. Turning again to the house, we note the grand old Marechal Neil in pride of position in company with Mad. Berard and Gloire de Dijon. Passing round the footway we find a little bedding of Lilies, and a stern forbidding-looking Aloe pseudo-ferox, also Lilies of the Valley, Primroses, Lobelias, Sweet Peas, all of the choicest selections. Of Roses everywhere we note Helen Keller, White Lady, Beaute Inconstante, Sunrise, Grand Duchess Melita, and Elise Fugier. This part of the garden is intersected by a high trellis of climbers of Mad. Berard, White Polyanthus, Cloth of Gold, Yellow Banksia, Paul's Carmine Pillar, Macartney Grandiflora, and others. The Gladioli claim special notice, for there are some fine blooms of Groff's strain, and Pooler's Own, yet unnamed to the public, but evidently with a future of note. A little bed of Carnations are here, and amongst them we find such beauties as J. Girdlestone, Trojan (the champion white of the world), Loloma, Urania, Mrs. Davis, Pasadena, J. N. Williams, and Aldgate Pink. The last-named is spoken of as the finest decorative Carnation to be found. Many others worthy of mention must be passed, and, as we make way into the first Rosary, we pass Ernest Morel, one of the prize 24 Roses, and a lovely crimson lake Sweet Pea, brought out last year, and named King Edward VII.

As we have thus far only brought our readers to the first Rosary, we will reserve the special selection of Roses and Carnations until next issue.

(To be continued.)

South Corner Of Residence, showing Gladioli and Rose Trellis dividing Garden.

CHRYSANTHEMUMS.

THE LAST POTTING.

It is not wise to fix a certain date upon which all the plants should be repotted for the last time, simply because they are not all in the same condition. Any time between the last week in May and the end of June will do for the final repotting of the plants. Pick out those which are sufficiently advanced in root action, and deal with them first, and the remainder before they become too much potbound.

As the plants will now be growing in pots of different sizes, it will be necessary to give them the final shift accordingly. The strongest growing sorts should be placed in the largest pots—10-inch—and the weakest varieties and the latest rooted in the smallest pots—8-inch—and then the proper balance of growth will be maintained.

The inside of every pot must be quite clean and dry before being used. The crocks, too, should have been washed and dried ready for use. It is not the quantity of the crocks, but the maner in which they are placed in the pots, which ensures sufficient drainage. Generally there are vast quantities of manure water, as well as clear water, passed through the soil in the large pots, and, unless the drainage be in good order, the soil will quickly become sour, and the plants will suffer in consequence; it will be plainly seen that good drainage is a very important matter. One large hollow shaped potsherd should be placed over the hole in the first pot, then a thin layer, 1 inch thick, of smaller pieces, and, finally, on the top, a similar layer of pieces broken to about ½ inch in size. If a very thin piece of new turf, or some of the most fibrous portions of the prepared potting compost, be laid upon the crocks before potting proper is begun, there will be little danger of a block in the drainage.

The soil used at this potting should be of a good holding nature—that is, with plenty of fibre in it. Very rich soil is not suitable for the incurved sorts, because depth, solidity, and general refinement of bloom would not be obtained from plants grown in such material. Although a much richer compost may be employed for the Japanese varieties, fairly firm potting is necessary. The soil for the Incurved section, the Anemone flowered, Reflexed, Single, and Pompons should be made firm in the pots, although it is not necessary to ram down the compost as hard as a highway. If the growths are timed correctly, that will be one important factor in the due ripening of the wood.

Mix the following compost for Japanese varieties, namely: One-half fibrous loam with the grass in it just devayed, chop it small enough for use, and pass the whole of the finest fibreless portion through a ½-inch mesh sieve; ¼ part fresh horse manure, and ¼ part half-decayed leaves. This forms the body, as it were, of the compost. Next add to each barrowload of it a 5-inch potful of soot, one of bone meal, one of some good artificial manure, one of ordinary ashes; a 4-inch potful of dry lime and road grit, or coarse sand, in sufficient quantity to make the whole mass porous.

For the other sections use a 3-inch pot for measuring out the manures, bones, and soot; also half the quantity of horse manure.

Place the fibrous loam in a thin layer on the ground, or on the floor of the shed; next add the sand, then the leaf soil, and finally the soot, bones, and ashes. When the sand is sprinkled on the fibrous loam it adheres to it, and does its appointed work more efficiently than if it was mixed with the finer constituents of the compost. Turn over the whole mass three or four times so as to get all parts well incorporated together.

In potting, scatter a small pinch of soot over the drainage, then some of the coarser portion of the mixture on the soot, and make it firm with the blunt end of the potting stick; upon this put the ball of soil attached to the plant, only removing the old drainage carefully from amongst the roots without doing them an injury. Put in small quantities of soil, and firm it with the blunt end of the stick as each layer is placed in. Leave a space of about 1½ inches below the rim of the pot, for watering and future top-dressings.

Stand the potted plants once more in a sheltered position, whether it be temporary or permanent for the summer.—Geo. Garner.

CHRYSANTHEMUM NOVELTIES.

The time is fast approaching when we shall begin to see the fruits of our labor for the past year. Perhaps no other flower is watched so zealously as the Chrysanthemum. Especially does this apply to novelties or new varieties, which come and go, with each succeeding year.

A few years since the limit was thought to have been reached in size and color, but it is safe to say that within the last two or three years marvellous strides have been made, and this year is no exception. For as we see the novelties developing they surpass all expectations, and in many instances supersede all other varieties.

Maynell is a glorious flower of the largest size, over 8 inches in diameter, with broad, massive, incurving florets, many over an inch in width; color, a dark, velvety crimson with old gold reverse. A most attractive flower, indispensable for exhibition.

Miss Mildred Ware, a very lovely flower of a unique color, reminding one of that of Chas. Davis, but with the size and formation of Mme. Carnot. Undoubtedly a grand variety.

F. A. Cobbold, one of the grandest and easiest growers sent out in years; height, 3 feet, with its very large flower set on top of the finest foliage imaginable, color, bright rosy pink, very distinct, somewhat resembling Mrs. G. Mileham, when well finished.

Cheltoni is the greatest sport we've had in years; never has it been my privilege to see such a beautiful variety. It is the exact counterpart of its parent, Miss Nellie Pockett, with the exception of color. Usually, sports, more especially from white varieties, are washy and undecided, but in this we have a most beautiful yellow, quite as deep in color as Colonel D. Appleton. Those who have not seen Cheltoni can readily imagine a well-grown Nellie Pockett as yellow as Colonel Appleton.

Leilia Filkins, the brightest of all pinks, much brighter than the best Viviand-Morel; an easy doer; habit of the best, with the flower resembling that of Mme. Carnot in formation.

Donald McLeod is a superb variety in every way. An enormous flower carried on stiff, stout stems, retaining its handsome, overlapping foliage to the bench. Color, bright fiery red, reverse and edge of petals bright gold. Truly a wonderful combination of color, easily standing out alone in its class.

William Duckham undoubtedly will prove the novelty of the season. All who have seen it, without hesitation, pronounce it to be the finest introduction in many years. Words can scarcely do it justice. Habit of plant, stem, and foliage are all that can be desired. Its massive flowers are carried erect on stiff stems. In color, it stands alone, being a lovely, warm or glowing satiny pink. Its broad, massive petals, many fully an inch in width, incurving, with the grandest finish possible in a Chrysanthemum. This will undoubtedly be the exhibition and commercial pink when known.

Harrison Dick, a strong, good grower, with large, handsome, glossy foliage, carried well up under the flower, and retained to the bench. A beautiful combination of bronze and yellow, somewhat on the style of Lord Salisbury, but of a stronger constitution. Flowers, fully 9 inches in diameter.

Henry Barnes is the darkest of all the crimsons; flowers of full exhibition size, reminding one of George W. Childs, only three times as large and very much more vivid in color.

Ben Wells.—In this we have a monster in size, yet a most beautiful, graceful flower, of a soft flesh color; one of the most vigorous and easy growers.

Mathew Smith, the largest of all Chrysanthemums, the outer petals at this date reach one foot across; color is a combination of yellow and bronze.

Lord Alverstone is a very dwarf grower, and undoubtedly the darkest we have, a most fascinating flower. The inner side of petals being so very dark, with the golden reverse showing so conspicuous, make it altogether very attractive.

EARLY NEW CHRYSANTHEMUMS.

We have been delighted to find among the European importations some startlingly good earlies, which will be of value to the American trade. We have tried more than 100 French sorts, and on October 15 we cut and photographed the following, all of which are of fine exhibition size:—

Baron Chiseuil, red and chamois color, incurving centre and reflexing outer petals.

Etienne Bonnefond, an incurving buff, with broad petals; 8½ inches through on a horizontal diameter; a notable sort for any season of the year.

Mlle. Marthe Morel, a pearl pink much resembling Viviand-Morel in form; will prove a fine early commercial sort. Color, form, and habit, as well as size, are fine.

Mme. Paul Sahut, a gem among earlies, perfect in color, which is tinted yellow and pink in the centre on opening, but rounds up into a plumy, snow-white ball. We can't find a single fault with this variety.

Neveu Rene, exhibition color, rosy magenta, reflecting form, with incurving silvery centre; very showy.

Salome, a gorgeous golden yellow reflexing form, with incurving centre. A fine commercial yellow for this date.

Mlle. Touzet, of great value, as it is best described as an "October Chadwick."

Among the English earlies are three very fine large varieties that are valuable additions to our mid-October sorts.

Mrs. A. McKinley is a fine, big bloom of buff and reddish gold—a bright color that lights up beautifully, and, we think, will prove a taking variety.

Ethel Fitzroy, a grand, glowing flower like an improved Kate Broomhead, very bright in color and round and beautiful in form; a stunning sort for cutting October 15.

Miss Olive Miller, a dainty lavender pink, with broad petals arranged in showy form. About the prettiest pink that we have seen at this date.

All of the above are nice, free growers, with good foliage, and nothing but an unpopular color would debar any of them from commercial use, while the whites and yellows and Miss O. Miller are "early commercials" par excellence. Besides the above ten, we have had excellent blooms of "Carrie," Mr. Wells' early yellow, which came into flower by September 15. The color and form are fine. It is of medium size and a nice grower, but very bright in color. Where an early red is needed, Goocher's Crimson will be valuable; it is free and a nice grower, has a rounded dahlia-like flower, and would not "burn" if set on fire.

By November 1 Lord Hopetoun will be fully finished (it is beautiful to-day, October 19, but not ready to cut). It is larger than last year, and, if anything, the colors are more intense—bright scarlet and pure gold.

S. T. Wright is not quite so far along, but promises a large size and deeper shades of both gold and yellow.

This promises to prove a good year for fine blooms; and if there were a mid-October exhibition, the novelties would make at least a dozen fine entries.—S. A. Hill in "The Florists' Exchange."

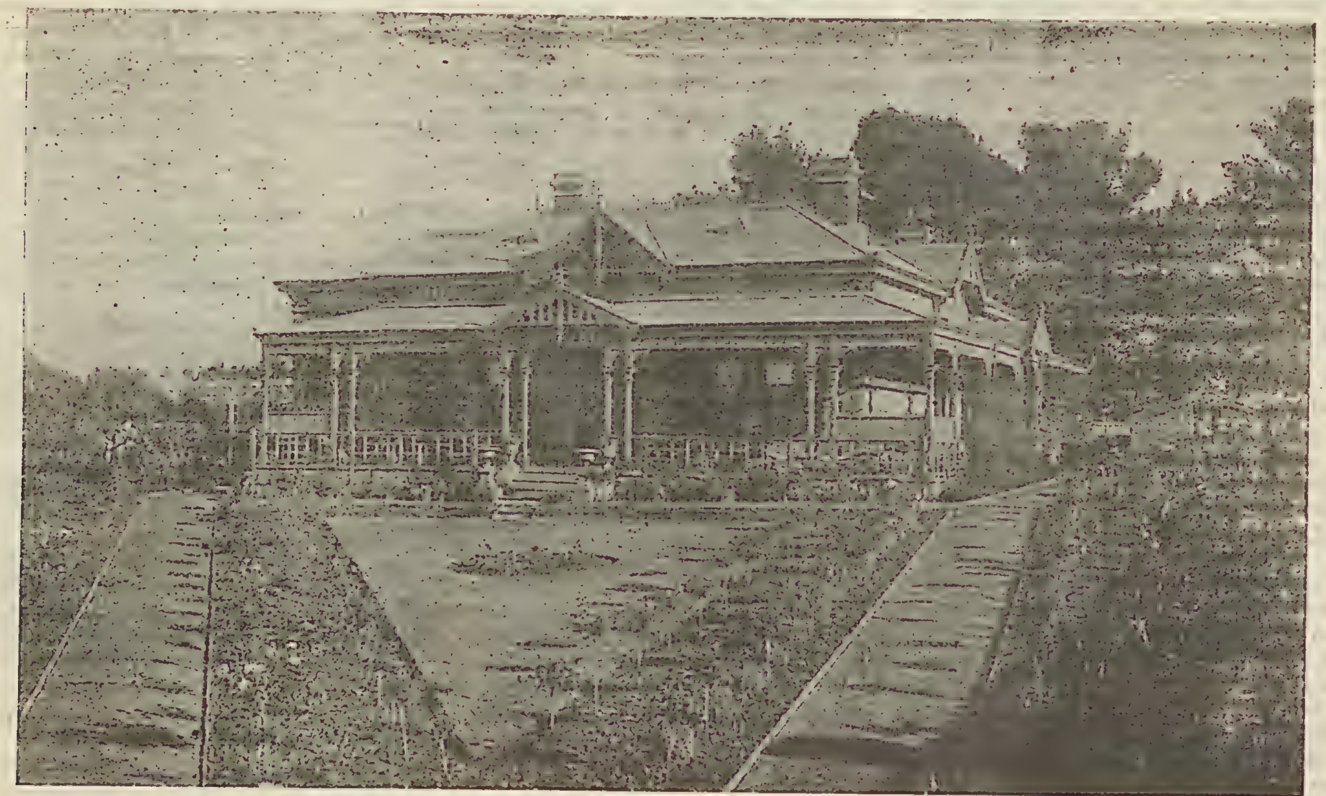
CHRYSANTHEMUM BUD FORMATION.

The cluster of buds illustrative of a first "break" on a main stem, is abnormal. The sketches were made from Nature; in past years I have had much trouble with some varieties at the time when the first "break" occurred. Instead of a crown bud with free growth shoots below it, a number of buds have formed exactly like a cluster of terminals at the end of the season. By simply removing the buds I lost valuable time, because more buds showed instead of growth shoots. This bud removal was, in some instances, a long business, quite a month elapsing before branches free of buds would grew. So I adopted the plan of topping the main stem well below the cluster of buds, with the result that growths without buds in them appeared, and less time was wasted. I found such sorts as Viviand Morel and Charles Davis very troublesome in the matter of persistent bud formation at the time of the first natural "break" of the plant.

THE RESIDENCE OF MR. J. H. WEIDENHOFER.

The garden we have to describe this month is situated in Kent Town, about a mile from the centre of the city. The first thing to strike a visitor is the neatness and method with which Mr. Weidenhofer has laid out the place. Having a property covering something over an acre in the shape of a triangle, with the house already set down in the middle of it, the problem was how to best utilise the house surroundings so as to harmonise with it, and at the same time give the utmost efficiency in both appearance and utility. This has been admirably accomplished, and for so comparatively limited an area we may say we have never seen better disposed effects.

The front entrance is at the apex of the triangle, with Rhamnus hedges down each side. The house, which has a broad, comfortable verandah facing the entrace, is some 10 or 12 feet higher than it, and the garden is consequently sloped gently from the house down to the gate.



The Residence of Mr. J. H. Weidenhofer, "Rosalie," Kent Town.

A very large amount of exhausted or too clayey soil was carted out after the grading was done, scores of loads of old cow manure and loamy soil carted in to improve the beds. The centre of the triangle-shaped front garden consists of a Buffalo grass lawn, also triangle-shaped, and the beds and lines of Roses are laid out from this at the centre in rather straight but hardly avoidable geometrical lines. Around the centre three-sided bed are planted Roses and Carnations, the bed being some 7 ft. wide on each side. 3 ft. ½-standards are used for the back row, and 18 in. ½-standards, or dwarfs, are used in the front row, leaving some 4 ft. between the rows, the front row planted to face the middle of the spaces between the back row; between the dwarf Roses are planted choice Perpetual Carnations. Facing these on the opposite side of the paths are similar wide beds with Roses and Carnations, and between them and the hedges further beds are being filled, the pathways being much narrower.

Each path is carefully graded and sloped and covered with sifted gravel, both sides of each path having a slightly sunken gutter of concrete cemented. At the base of the triangle, and just opposite the front verandah, Mr. Weidenhofer has planted some 40 or 50 plants of another very favorite flower of his, viz., the Delphinium, the side spikes of which, with sprays of Asparagus Plumosus, he assured us, constitute his wife's most useful table decorations during the hottest months of summer.

The front verandah, being elevated 4 or 5 feet above the beds, is bordered by a double row of 10 or 12 choice climbing Roses, the back row being taken high up, the front row carried festoon fashion lower down. On the verandah facing east is one of the finest plants of Asparagus Plumosus we have ever seen, over 20 ft. in length, and rising from hundreds of suckers 12 ft. high, and at the base 3 ft. through. No wonder Mr. Weidenhofer's good temper and patience are at times tried by numerous requests for trails of Asparagus to decorate churches, &c.

Just beyond the Asparagus and between the house and the hedge, is a compact, neat gable-roofed glass house about 12 ft. x 20 ft. x 10 ft. high in centre. This has been used by the owner for propagating a large number of those Carnations that have proved of best decorative value for his house. He also grows a few ferns, as these are pets of Mrs. Weidenhofer's, and, doubtless, when in due course the fever strikes him, he will add regal and show Pelargoniums and tuberous Begonias, a few of the very best, to the contents of this house.

On the opposite side of the house is the little model orchard of peaches, apricots, grapes, cherries, oranges, lemons, &c. The cherries (6 of the best varieties) and 12 vines of the best dozen varieties, are enclosed in a wire netting hip-roofed frame house, one inch mesh netting being used. The wire was specially stretched and laced so as to show practically no sag and little or no join, and, though put up at a cost of £50, it will, we should think, last out the owner's existence.

The cherries, which are kept dwarf pruned and severely summer pruned, have this summer, at four years old, produced heavy crops of fruit to delight the grower and tantalise Jack Sparrow. The vines, too, are carefully spur and rod pruned, and have an immense crop of shapely bunches. Beyond the fruit garden is a further continuation of the flower borders, restricted practically to Roses, dwarfs and own roots, and Carnations, and it is here that Mr. Weidenhofer is testing about 100 of the best of the Australian tree Carnations, and doubtless very many will, before a year is past, find their place on the rubbish heap. This part of the garden is shut in by a 12 ft. high galvanised fence from the road, and against this fence there is a two-year-old passion fruit vine spreading rapidly upon the wire netting against the iron, and loaded with hundreds of plump fruit. Mr. Weidenhofer wonders why more people do not invest in a plant or two of this luscious semi-tropical fruit so well adapted to hot weather and so refreshing in the deep vivid color of its evergreen glossy foliage.

Three large trees of the best new Californian varieties of soft shell almonds hide the stable and coach house from the dwelling. Along the back wall constituting the base of the larger triangle, and making up the third side, are the coach house, stable, and fowl pens and yards. Mr. Weidenhofer fancies Buff Orpingtons, and his fowls are fine specimens. He plants alternate pens with lucerne and puts the clutches of chicks with their mother in the alternate dust-dry pens, and the chicks get through into the lucerne and soon earn a living for themselves, and keep clean and healthy. Between the pens and the house, which are shut off from each other, is a further garden of Roses and several flowers, such as Violets, &c., which are Mrs. Weidenhofer's favorites.

On the verandah facing the west, and just in front of the grapery, is an immense growth of Ampelopsis radicantissima, and for two years' show of foliage produced by two plants, we must say they beat anything we know. During the worst summer days these vines, with their dense foliage, make a difference of several degrees, 10 or 12, to the rooms that they shelter from the fierce afternoon heat, while in winter, the foliage being shed, they obstruct no light.

Now we have had a run round the various points of general interest in this charming garden, and we will go back with the owner to make the personal acquaintance of some of his special favorites in the Rose and Carnation borders. Among the hundreds of varieties grown the following are in bloom, and of special note at Christmas time:—White and Pink Maman Cochet, Goubault Souv de Malmaison, The Bride, Christine de Noire, Marquis de Litta, La Sylphide, Madam Abel Chatenay, Chevalier Angelo Ferrario, Mons. Fillier, Ethel Brownlow, Catherine Mermet, Sunset, Bridesmaid, Marie Van Houtte, Mad. Francois Jamin, Souv de Paul Neron, La France, Gustav Regis, Princess de Sagan, Mad. Jules Grotez (a special favorite), Augustine Guimoiseau, Kaiserin Augusta Victoria, Gruss aus Teplitz, and Marquis of Salisbury (the latter three also special favorites), Franciska Kruger, Perle des Jardins, Antoine Rivoire, Dr. Grill, Belle Siebrecht, Madame Lambard, Jean Ducher, Cecil Brunner, Rubens, Reve d'Or, Chesunt Hybrid, Madam Eugene Resal, Souv de Madam Pernet, and Narcisse. This brief list is mentioned without detriment to the rest, or with no attempt to be final in a selection, or to make invidious distinction where so many are worthy.

Among the Carnations, Mr. Weidenhofer (who is not an exhibitor, although a member of the S.A. Carnation Society, has so far adopted the best of the American varieties as his choice. We say so far because he is yet a young grower, and has not become acquainted by a full season of bloom with the genis that the Sydney specialists have been turning out, and he sticks pretty well to those he knows before he goes in for numbers of sorts that he has so far only seen in exhibition stands. So far Flora Hill and Ethel Crocker, imported by Jas. Beggs, and Aldgate striped Pasadena, Manzanita, Juanita, and Alma, raised by Smith & Menzel from American seed, are prime favorites, and grown in from 10 to 20 plants of a sort, but Miss Georgeson Girdlestone and Richard Douglas promise to enter the lists as potential favorites. Mr. Weidenhofer has so far selected first-class decorative types with good color, scent, long and profuse flowering, and special adaptability to table use rather than the flower whose symmetry and perfection of petal and form proclaims it a show flower.

ENGLISH GARDEN NOTES IN SEASON FOR SOUTH AUSTRALIA.

(From "The Gardener.")

HARDY FLOWERS.

Papaver Mrs. Moon.—As these notes are being written we have entered upon the reign of the Poppy, and shortly we shall have many in bloom, with their crinkled, fluttering petals and beautiful colors. Among the advance guard we have P. orientale, which is such a brilliant occupant of the garden. It has long varied from the salmon scarlet flowers, with which some of us have been familiar for many years, and those who visited the last Temple Show had an opportunity of seeing the fine flowers sent by Mr. Godfrey, of Exmouth, and other raisers. In P. Mrs. Moon we have one known to be a hybrid between the Oriental Poppy and P. rupifragum, and a very beautiful flower into the bargain. It is of moderate height, light and elegant in its habit, and with rather fragile looking flowers, of the size of an average bloom of the Oriental Poppies. The flowers, which are of a fine glowing scarlet, are remarkably light looking, and have an almost ethereal way of fluttering in the slightest breeze. Unlike the other hybrid Poppy mentioned below, P. Mrs. Moon is said to produce fertile seed, and to reproduce itself truly in this way.

Papaver J. Carrington Ley.—This hybrid Poppy should, perhaps, have been mentioned before the other, seeing that it has been longer in cultivation, but it is not so distinct in its way, though it has peculiarities and characters of its own. I have now had it in my garden for several years, and during that time it has proved true to its reputation of never producing fertile seeds. The plant has consequently to be propagated either by division or by root cuttings. P. J. Carrington Ley has for its parents the same species as Mrs. Moon, but the flowers are firmer and more cupped, while they are not quite so bright in appearance, though possessed of more substance. It was raised by the well-known amateur whose name it bears, but was for some time distributed privately simply as Mr. J. C. Ley's hybrid Poppy. The foliage more nearly resembles that of P. orientale than that of P. rupifragum.

Aquilegia truncata.—According to the strictest tenets of the botanists this is only one of several forms of A. formosa, which comprises a number of varieties known in gardens by such names as A. arctica, A. Californica, A. eximia, and the one under notice. It is often more convenient, however, for garden purposes to keep them distinct, and as A. truncata is being offered as such it may be desirable to speak of it by this name. It is a pretty plant, partaking much of the characters we associate with the lovely long spurred Columbines now so popular. With me, however, it is dwarfer, and has a shorter flower all over. The color is blood red on the exterior, but when the flower is turned up the yellow centres are seen. It is a pretty form, which seems longer lived than many others of similar or allied hues, and is thus desirable for those who wish a variety of color in their favorite Columbines without the trouble of frequently raising them from seeds.

Anothera ovata.—Evening Primroses are general favorites with everyone, though all do not come into bloom when "the shades of night are falling fast." Both the day and the night bloomers are welcome, particularly as they include in their numbers plants which can be used either in the border or the rockery. In E. ovata we have a charming little plant, which is better adapted for the rock garden than for the border, though it may be grown in the front of a dry border if desired. It is a beautiful little plant, with ovate leaves and neat little yellow flowers on short stems. It is a day blooming species, and the flowers resemble nothing so much as those of the common Primrose when seen a little distance off. I grew it for several years on a low rockery where it was partially shaded from the sun by other plants. I do not, however, think this necessary, and would recommend a well drained but rather moist soil in sun. It comes from California, and may need some winter protection in cold districts.

Libertia grandiflora.—One has no hesitation in saying that it is surprising and regrettable that the Libertias are so little met with in gardens. There is some cause for the infrequency of their appearance in the garden, and it is probably their tender character in some places. This cannot be attributed to geographical position alone, for they are not only hardy in a great part of England and Ireland, but in several of the Scottish counties, particularly near the sea, and even in the suburbs of Aberdeen, where L. grandiflora, the one under notice, has been grown for many years. This New Zealand plant has only been in cultivation for about thirty years, and it is prized for the effect of its tall spikes of white flowers, rising well above the Iris-like foliage. The flowers are in what is technically called "spike-like panicles," and are very numerous. In form they much resemble those of the Tradescantia, or Spiderwort, while the long leaves are about ½ inch broad. I find that it does best on a dry, sunny mound in the rock garden, but it may also be used in a dry part of the border. It is at present in bloom in my own garden, but it may also be used in a dry part of the border. It is at present in bloom in my own garden, where it has been established for several years, and has withstood the hardest winter we have had in living memory—that of 1894-5. It is very attractive indeed. It may be raised from seeds or by division in spring, though if bad weather follow division there is some risk of loss.—S. R. NOTT.

CHOICE CACTUS DAHLIAS.

As it must be obvious that it is impossible to obtain the best results with inferior varieties, or to succeed in competition with obsolete ones, I give a selection of the best. I do not say that there are no others as good, or that these comprise all those worth growing; but at the same time, the following lists are thoroughly up to date, and anyone possessing them need fear no one.

I first give eighteen varieties for exhibition, not including any flower catalogued for the first time this spring, and my aim has been to give a selection of colors, as well as to pay attention to their other merits.

In yellow, we have Mrs. J. J. Crowe, well known, and Mrs. Edward Mawley, a large flower, extraordinarily deep, and of regular, incurved form. This flower takes an exceptionally long time in developing, and lasts accordingly.

In white we have still to grow Lord Roberts, unless we can afford a new variety mentioned later on. His lordship is usually in grand form in early August, and is of wiry growth.

For scarlet and crimson, Mrs. Winstanley, a dwarf sturdy growing variety introduced last spring, is good, the flower large, has a strong stem, and the form is first rate; Mrs. Carter Page is fine when it is to be had, but is a shy bloomer.

In dark varieties we have the choice of J. H. Jackson, huge blooms, almost too large for first-class exhibition, but very fine flowers; Aunt Chloe, medium size, pointed in petal, erect habit, and strong stems. These are both of last spring's introduction.

Bicolors are now coming to the front. Columbia, a long petalled variety, is pretty when set up for exhibition, but pendent on the plant. Color: scarlet, with white at the tips. Richard Dean, also scarlet and white, of good form, has very long stems.

Orange and salmon in various shades are common in Cactus Dahlias, the following being the best: Clara G. Stredwick, dwarf and free flowering, long, thin petalled flowers; Florence, yellowish orange, wiry in growth, and of easy cultivation, combined with good form of flower; Lottie Dean, straight, narrow petals, amber, tinted with pink, and of good size; Ajax, a tremendous flower, a variety pretty well known; J. W. Wilkinson, deep purplish crimson, requires good cultivation, but is very fine when well grown, very long, fine petals; J. Weir Fife, deep purplish maroon, of large size, and good for exhibition.

Amongst varieties with suffused colorings are: P. W. Tulloch, light salmon, suffused with lilac, a wiry grower; Miss Winchester, shaded coral pink, erect habit, and fine form; Vesta, beautiful color, rosy pink, which makes it valuable, although rather heavy.

In conjunction with the above, I feel I ought to mention Artus, Pretoria, Mrs. Jowett, Charles Woodbridge, Mayor Tuppenney, and Uncle Tom.

If, however, I were to give the varieties more particularly for cut bloom and garden decoration, I would recommend the following:—Mrs. Winstanley, Florence, Aunt Chloe, Khaki, Arab, Gabriel, Mrs. J. J. Crowe, General French, Floradora, Lord Roberts, Britannia, Uncle Tom, Countess of Lonsdale, Magnificent, William Jowett, Capstan, Alfred Vasey, and Laverstock Beauty.

The new fancy Alpha I have not included. It is very constant, and free flowering, of fairly good Cactus form, and was quite up to expectation last summer.

Before leaving the subject of varieties I might mention a few of the 1903 new flowers, but many of the best have from time to time appeared in "The Gardener" in different ways, and so I deal with them very briefly.

Promising white varieties are Eva, one of the two flowers which received the highest number of votes in "The Gardener" competition last autumn; and Albion, a long, narrow petalled flower of promising appearance as seen last autumn.

H. J. Jones, the other variety which secured highest votes, equal to Eva in "The Gardener" competition, is yellow, shaded pink towards the tips. Charm is a flower of unique coloring, a mixture of yellow and brown, tipped with pure white.

Mrs. W. Cuthbertson is a large, dark, fine petalled flower, likely to be a good addition to the darks. Vesuvius is a Fancy Cactus, with yellow for ground color, striped and speckled with crimson, and of good Cactus form. Manxman is a blended and distinct colored flower, of bold and telling appearance.

Clarence Webb, of particularly incurved form and pretty color, is salmon red, shading at the base to yellow. Etna, a color new in the Cactus section, is a shade of deep lilac, and of true Cactus type.

Minnie West is clear yellow at the base of the petal, but tipped with pure white, a fine, large flower.

F. H. Chapman is of tremendous size, but of very refined form, deep orange in color.

Several other new flowers were of a most hopeful character, but for the ordinary growers, amateur and gardener, the few above-named are the cream of 1903.—RAISER.

COMMONSENSE FUCHSIA CULTURE.

Those who wish to form a nice collection of Fuchsias should buy a few good plants, and raise others from seed. Cuttings can be taken at any time in a warm greenhouse, or during summer and early autumn in a cold one. The easiest cuttings to root are those only 1 inch long; if these are put into equal parts of loam and silver sand and kept moist under a bell-glass they will be ready for potting off singly in three or four weeks.

The bought plants should be potted into clean pots, with a compost of loam and leaf mould, mixed with silver sand and a little broken charcoal. When they are growing again they should be watered, daily in warm weather, with the weakest liquid manure, many sorts being used in succession. Pyramid Fuchsias are not as graceful as are natural-looking bushes. To obtain the latter, the side shoots must be stopped when they have formed three joints, and the main shoot stopped when it is as tall as the plant is wished to be. When enough bushy branches are formed, jutting out on all sides, stopping need not be continued.

Fuchsia raising from seed is interesting, for magnificent plants with enormous flowers are occasionally gained, and the poorer plants will be good enough for next year's bedding out. Summer is a capital time to begin seed sowing. Seedlings taken from a very warm propagator, hotbed, or hothouse are weakly and unsatisfactory.

The young plants will grow very rapidly, must be pricked off at once into a pot each, and never allowed to suffer for want of water or root room. Liquid manure should not be given until buds are forming. I have raised Fuchsias from seed that were larger flowering and nearly as double as Phenomenal; one other pretty variety obtained thus was a single, with rose pink corolla and carmine scarlet sepals.

Fuchsias do not like a higher temperature than 60 deg., and need shading from fierce sunshine. They can be enjoyed by gardeners who have no greenhouses, for in sunny windows (shaded) they thrive excellently. By successive sowings and successive striking of cuttings, the greenhouse gardener can have Fuchsias in blossom all the year.

When a plant has done flowering it requires a rest, but if this happens in spring or summer it is too plucky to take one, so should be cut back and placed in a cooler spot. Out of doors in a shady border, planted out, is a good plan. After a winter rest a Fuchsia should be cut back severely and repotted. Fuchsias will not show at their best unless they are syringed in the summer evenings.

If green fly attacks a plant, give it a bath in suds made of soft water and soft soap, not immersing the soil, but afterwards removing its top layer, upon which the fly will be present, and top-dressing with loam and leaf mould. By seed sowing, and by buying a new variety occasionally and propagating it, the gardener will quickly obtain a house full of Fuchsias.—M. HAWTHORNE.

ANEMONE ROBINSONIANA.

Our native Anemone nemorosa, the Wood Anemone, has given us a number of charming forms, but none is more popular than the lovely one known as A. n. Robinsoniana, one of the prettiest flowers of spring. With large sky-blue single blossoms, it pleases all who see it in any part of the garden, and he who could secure a carpet of its flowers some yards across in his grounds would possess in them a feature of singular beauty. The plant is cheap, easily procurable, and, at the same time, can be cultivated almost anywhere.

WATERING PLANTS WITH HOT WATER.

A writer in the Queensland "Agricultural Journal" advances some interesting points in this connection, and as hundreds of our readers are in a position to test them, we should like to hear of some practical experiments being made, and to give publicity to any results of value reported to us. He says: "We do not know how we can sufficiently recommend this practice either as a curative or a preventive method. During the winter is perhaps the best time to adopt the hot water treatment by amateurs and those having plants in dwelling rooms. It is a matter of common knowledge that soil enclosed in a pot in which a plant is growing ultimately becomes sour, and has indeed a certain poisonous quality. This toxicity is due to the presence of organic acid in excess, and which in the ordinary open ground conditions would have been removed by bottom drainage. Plants growing in pots are under distinctly artificial conditions, and there are many causes which lead to the accumulation of these toxic acids. For instance, too deep planting, or when roots are sufficiently ærated, the use of over hard baked pots or glazed receptacles, the compacting of the soil, and particularly the absence of or clogging of drainage."

The soil in experiments by the writer was copiously watered with water at the high temperature of 125 to 130 deg. Fahrenheit. The water was applied until it ran out in abundance from the bottom of the pots. After this washing the plants were placed in a warmer situation. After the plants have been treated to a hot water bath it would be well to replace the loss of food elements by slight applications of liquid manure.

ANSWERS TO CORRESPONDENTS.

A. H. Scarfe.—No. 1. Italian Prune (Fellembez). No. 2. Early Orleans.

Albert Bretzke and other Enquirers.—Mr. Bogue Luffmann's book, reviewed last month, is published by The Book Lover's Library, Melbourne; no price is given.

A. W. Lowe.—The address of Ernest Benary is Erfurt, Germany.

Carnation.—Better results are said to be obtained by breeding between varieties from a common source than between varieties of widely different origin.

Queen.—Chrysanthemum flowers with small heads will yield a larger quantity of seed than flowers with large heads.

Grafter.—A pear grafted on a quince produces larger fruit and yields more abundantly than when grafted on pear seedlings.

Pineapple.—Pineapples can be grown in South Australia, but not commercially.

Plums.—The peach is a satisfactory stock for plum grafting.

Unley.—Now is the time for budding Roses. Any nurseryman will give you a practical lesson in budding. This is better than any amount of description of the process.

Front Garden.—We are pleased to note that you intend to try Cinerarias. Plant the seeds now.

The Orchard.

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MARVELS OF FRUIT-BREEDING

By Marcus Woodward.

[From "Pearson's Magazine."]

(Continued.)

The fruit slowly ripens, and is brought to judgment. There is an exciting moment when it is tasted. Many points are taken into consideration. Is the flavor good? Is the fruit a good color? Does the flesh separate freely from the stone? Is it as juicy as it should be?

A great work of selection now begins. Only the finest are allowed to survive. Perhaps there have been a hundred seedlings—perhaps only one is chosen for further propagation. All the others may be bound too closely to the old types; it is the exceptional type that the propagator seeks. Having made his selection, the next thing is to "work the tree," in horticultural parlance—in other words, to take the new buds of the seedlings, and to bud them on to approved stocks.

"Breeding from the wood" is a matter of absolute certainty, unlike "breeding from the seed," for the buds will breed true to their parents in every case, whereas you can never know how seeds will turn out.

In the Sawbridgeworth nursery the plum stock is generally used for the budding of peaches and peaches and nectarines; in America the almond stock. The bud is simply inserted in a slit in the bark of the plum stock, and is bound securely in place. This bud throws out a shoot which may bear fruit in its second year, when the new tree is one year old, technically a "maiden," but more often fruit is not borne until the tree is two years old. Now the grower may see whether his new specimens are good bearers, and, this, of course, is an important qualification.

And now upon the varied throng of new seedling fruits, again the horticulturist exercises selection, and, if he still seeks improvement, if he still has an ideal to achieve, he again begins the work of cross-breeding the individuals, knowing that many generations must pass before the traits that he wishes to foster shall be fully developed.

And at each successful stage of the work a new species of fruit is christened, and the trees are put upon the market. The kudos is the grower's, but not necessarily the profits. The new fruit cannot be copyrighted, like a new book. Once sent out to the world, any man may produce his own editions, and sell them for his own benefit.

It was by judicious selection and cross-breeding that there was grown that perfect peach, the Duchess of Cornwall. It is the finest and earliest of the English peaches. Its pollen parent was the Early Rivers peach, and its seed parent, the Early Rivers nectarine, whose seed parent was the famous Lord Napier nectarine, whose seed parent was the Early Albert peach, whose seed parent was the Grosse Montague peach.

The earliest of all peaches at present is the American "Alexander," a good peach, which has, however, an unfortunate habit of dropping its flower buds when forced. The Duchess of Cornwall is faultless in this respect, and its flavor of nectarine makes it one of the most delicious things in the world.

In some cases it has happened that all experiments have failed to improve a fruit. Thus, in 1869, a large black cherry, ripening very early, was raised at Sawbridgeworth from the Early Purple Guigne. This cherry gained a first-class certificate from the Royal Horticultural Society in 1872, was christened the Early Rivers cherry, and still holds its own against allcomers, never having been improved on. The fruit has realised 32/ a bushel!

Again, one of the earliest and best plums was raised from a seed of the Precoc de Tours, in 1834, and has never been superseded, though experiments to improve it never cease. The original seedling tree of this variety is one of the sights of the Rivers' nursery.

Looking into these experiments in fruit improvement one is struck by the idea—Why not carry them further? Why not cross two fruits of absolutely different nature, and produce an entirely new fruit, unlike anything ever known? Why not an orange crossed with a cherry, an apple with a pear?

But the expert shakes his head. Fruits, to be cross-bred, must be nearly allied. It is just possible that occasionally a new fruit might be produced by crossing different families, but the chances are that it would be uesless and worthless from the market gardener's point of view.

The experiments carried out in England have all been made with fruits of the same species. By crossing different kinds of plums together and different kinds of peaches, cherries, and so on, they have succeeded in improving the size and quality, the productiveness of all the fruits they grow, and in many cases in prolonging their seasons.

For more sensational experiments one must go to America.

No man living has made more attempts to grow entirely new fruits than Mr. Luther Burbank, of Santa Rosa, California. On the fifteen acres of ground that he devotes to fruit and flower-growing experiments, some astonishing triumphs have been won—notably, by the crossing of the native American plum with the Japanese species, which has made it possible to grow luscious plums in various regions in the States where the old species failed. Plum-improvement experiments have been Mr. Burbank's leading line, and have given him his greatest victories. But his experiments have been endless.

Some years ago he prospected the possibilities of crossing fruits over a wide range. Taking the native Californian dewberry, he treated the blooms with the pollen of apple, quince, pear, cherry, hawthorne, Chinese quince, strawberry, and other fruits, and gathered the seeds of each berry obtained. In all, he secured five thousand seedlings, and stranger plants were never seen.

Some bore strawberry leaves, others raspberry, others pear leaves, a few were armed with short prickles, but nine-tenths grew shoots as smooth as an apple twig. A few, very few, however, bore any blossoms at all, and out of all the five thousand only two bore fruit—one like a pale blackberry, but larger, the other of the same nature, but a dark mulberry color. The final crushing blow to the experiment came when it was found that neither of the new fruits had any seeds!

On the other hand, Mr. Burbank has had many solid results from his experiments. He has taken the hardy, savage, worthless beach plum of his country, and, by many crosses with good plums, has produced a new fruit of wonderful productiveness. He has increased the size and quality of the Californian wild plum by two fold. He has grown a hybrid plum whose blossoms are declared to be "steel-lined and frost-resisting"—an invaluable qualification in a country where frosts are liable to do great harm to the fruit trees.

And he has produced a stoneless plum—a plum which bears a fully developed kernel, but no hard shell to it, so that one may bite freely into it without hesitation, and enjoy the nutty flavor of the kernel. Mr. Burbank hopes in time to remove the shell from the kernels of other fruits, and is confident that if he were to try for ten years he could produce a walnut without a shell if it were desirable.

But his most surprising and successful experiment was the crossing of the plum with the apricot. This produced a fruit with a distinctly new flavor, which has been christened the Plumcot. The fruit is like an apricot, but more highly colored—a fine fruit for dessert.

The United States Government has taken the subject of fruit-breeding in hand, and its Department of Agriculture maintains excellent laboratories where new varieties are produced.

The most important fruit which the Government definitely set itself to produce is a hardy orange that will survive frosts. Frosts every now and then play havoc with the groves of the golden fruit, and the experimenters hope to defy it by crossing the Japanese orange with the common sweet orange. The Japanese plant, although its fruit is of little account, is hardy, and loses its leaves in winter, and as it is in a quiescent state when frosts occur, it is less likely to be frost-bitten than the ordinary kind that grows all the winter through.

The English firm of Messrs. Veitch have produced a raspberry and blackberry cross, named the "Mahdi," which is a delicious fruit with a novel flavor. And Mr. W. Culverwell has succeeded in obtaining fruits from a black currant and a gooseberry hybrid—fruits a little larger than a black currant, but in color like a red but destitute of seeds, and set with fine hairs. A curious point is that whereas the gooseberries usually have solitary blossom, and currants often a dozen, the hybrid produces little bunches of four together. Such are the surprises of fruit-breeding.

SOUTH AUSTRALIAN GRASSES.

By J. G. O. Tepper, F.L.S., F.S.Sc., &c.

(Continued.)

PANICACEÆ.

Andropogon exaltatus, R. Brown, belongs to a genus of about a hundred species, distributed over the five continents. Australia contains some 24, of which South Australia only claims two or three, by no means conspicuous by their frequency of occurrence. The genus is distinguished by its simple branching spikes, which are more or less hairy, and includes the so-called Lemon grass.

A. exaltatus is perennial, and occurs on rocky banks near watercourses, forming small tufts with long, very narrow, awl-shaped leaves, much broader sheaths, and erect rigid stalks from two to three feet high. The panicle or ear is either short and dense or long and interrupted, consisting of erect spikes about three quarters of an inch long, and hairy, of which usually two (seldom three) are seated upon a short common stalk. The compound spikelets are about one quarter of an inch, and bear short awns. The writer has collected it on the banks of the Onkaparinga among the rocks, and on the Little Para at Bishop's Springs. Bentham cites it as occurring at the River Torrens, Crystal Brook; the Flinders Range and Lake Eyre on the authority of Baron Ferd. v. Mueller and Andrews. The former (Census, p. 132) records it also as extending to Western and Northern Australia.

A. bombycinus, R. Br., extends throughout all Australia, and is almost without any hairs, excepting the ear. The leaves are narrow, flat, and rather stiff, while the ear is longer, and the spikes, though at first erect, soon spread out, and become reflexed or bent back. It is recorded as occurring near Lyndoch, Gawler, the Murray, and in Central Australia.

Anthistiria ciliata, Linn, jun., the well-known Kangaroo Grass, occurs not only all over Australia, but is also spread over the tropical parts of Asia and Africa. It is a perennial grass, forming moderately-sized tufts. In the early days of the colony it was very abundant, being prominent among the others by its moderately broad, flat, smooth, soft, dark-green leaves and reddish brown, stiff, and erect stalks from two to four feet high. The sheaths of the leaves are sometimes hairy, and the ear is formed of not very numerous clusters of spikelets, of which the upper are sessile, the lower ones stalked. The rhachis or spikelet-bearing axis is covered with long brown hairs, the awn is very long, at the base enclosing the free seed. It is spirally twisted above this for some distance when ripe, and the untwisted part extended at a right angle. This form, observable in all the Spear Grasses, denotes a provision for securing the burial of the seed in the soil to a sufficient depth, so as to ensure protection from fire and other dangers; also to secure the most favorable conditions for germination and rooting. The process is the following:—When the fruit drops to the ground the heavier, sharply pointed, and barbed end is usually directed downward, the bend of the other end causing it to be elevated. When moistened by dew or rain the spiral twist unrolls with considerable energy, till the awn becomes quite straight. During this operation the seed end becomes soon fixed nearly upright in the ground, and is screwed into it on account of the free end being stopped from moving around by such obstacles as the stems and leaves of grasses, &c., the barbed point preventing retraction when the much more gently acting reverse motion takes place when drying takes place. Every casual wetting, therefore, forces it deeper down, till the soaking rains of autumn bring about germination. The same action causes the fruit of this and other like grasses with similar seeds to penetrate the body of sheep, &c., when it becomes entangled in the covering of the body.

The Kangaroo Grass shows best on rich and moderately rich, somewhat loose soil, but also occurs on sand and in crevices of rocks. Through over stocking proper seeding and renewal of the old decaying tufts is stopped, and the grass has now become rather scarce, and has been more extensively replaced than any other of the common grasses by introduced annuals. This is much to be regretted, as it represents a first-class fodder plant, and is much liked by all stock when not too rank. It fruits from October to January.

Three other species are found in tropical Australia.

Alopecurus geniculatus, Linne, extends over Australia and Tasmania, and is also common throughout the temperate parts of the Northern Hemisphere. It forms dense low tufts in the scrub of the hill districts. The leaves are flat, soft, and rather narrow, but only a few inches long. The stalks are more or less procumbent or bent down at the base, and those at one of the lower knots bend up sharply, hence the specific name of "knee-jointed." The stems are only from three or twelve inches high, and bear a slender, cylindrical, closely-imbricated spike from one to two inches long, with glumes hairy at the keel, and about one-twelfth of an inch long; the hair-like awn is also short. This grass flowers about the end of February, and is not very common.

OPERATIONS FOR JANUARY.

(By W. J. Allen.)

There are few districts in the State which have not felt the beneficial effects of the bountiful rains with which we have been favored during the past few months, and at the time of writing there is every prospect of heavy crops of all kinds of fruits. With the subsoil soaked, as it is, there is no doubt but that with ordinary cultivation there will be a tendency on the part of the trees to overbear, and it therefore behoves the grower to see that he does not permit too much fruit to remain on any of his trees, and to avoid this evil it may be found necessary to thin heavily this season so as not to exhaust the strength of the trees by overbearing this season, to the detriment of next year's crop. It is now an established fact that one case of good fruit is worth two of inferior—I might say often times worth a half-dozen cases of poorly grown fruit. Just as much care ought to be given to the cultivation this year as in drier years, and care should be taken not to suffer weeds to grow during the summer months.

Peaches, cherries, and apricots now find their way on to the markets. The grower should grade and pack these honestly in the most attractive way, so that they not only command attention but good prices when exposed to view on the market.

Summer pruning may be continued this month, and it is best to go over and regulate the growth in young trees. thinning and shortening back where required—that is where the tree is growing too thick—and pruning or pinching back so as to keep the tree evenly balanced and symmetrical. This summer pruning is more for young trees, to aid in directing the growth to that part of the tree where it is most required. December and January are the months for summer pruning the older trees in order to force out fruit-spurs and buds.

In districts where the fruit-fly has been troublesome in previous seasons, I would recommend growers to be very careful in picking up and destroying all fallen and fly-infested fruits, and boiling them in order to ensure the destruction of any larvæ which may be contained therein. As this is the only sure way at present known of helping to keep down this pest, I would urge on growers the importance of doing their best to destroy these larvæ.

Where irrigation is practised a thorough watering should be given the trees during the month. Be most careful to keep the water confined to the furrows, as wherever the land is flooded it is apt to become hard. As soon as the furrows are dry enough to work, cultivate the orchard twice, and loosen around any young trees with a fork-hoe.

Every care should be taken to destroy the Codlin Moth, which makes its appearance about the time the apple-trees finish blooming, lays its eggs on the young fruit and leaves, and after hatching works its way into the apple, and within a few weeks emerges and lowers itself down to the ground by a silken thread, and immediately seeks shelter by crawling up the tree and getting into any crack or underneath any loose bark, either on the tree, on props, or any rubbish which provides a hiding place. The orchard should therefore be kept free of such rubbish, and trees bandaged at a height of about 18 inches from the ground. The grubs harbour in the bandages, which should therefore be removed every ten days, and the grubs destroyed. Pick up and destroy fallen fruit.

Pruning of citrus trees may be continued wherever not completed

Wherever Thorny Mandarins show signs of bearing too freely, prune them a little more, also removing some of the fruit from the tree, so that it may not overbear and exhaust itself this season.

—Agricultural Gazette of N.S.W.

DISCUSSION ON POTATO CROPS.

SETS FROM 1 LB. OF SEED TUBERS.

In his communication, Mr. Lockwood tries to be funny over the fact that the number of sets which gave the enormous yield of over 1,000 lb. of produce from 1 lb. of seeds tubers was not stated. I have no records to enlighten him further upon the subject. The facts, there is reason to believe, were verified by enquiries that were made at the time of first publication, twenty-seven years ago.

I am glad, however, to be able to give a few particulars of a kindred nature which have not been published in "The Gardener," and they are not widely open to dispute. The results in the case to be named are far in advance of the "remarkable yield of 65 lb. from 1 lb. of seed" cited by Mr. Lockwood.

On April 3rd, 1875, Mr. James Pink planted 121 sets cut from 1 lb. of tubers of Eureka, and when the crop was taken up on August 6th its weight was found to be 672 lb., or more than ten times greater than the crop just mentioned. Moreover, the sets obtained from the 1 lb. of tubers are far in excess of Mr. Lockwood's "astonishing number of eighty." He will agree that Eureka was fine—for eyes. It was, and that was the characteristic of some other of the American varieties in those days. They were veritable "eye openers" in more ways than one, and I can assure him that the judges, from whom I was not many inches distant, had to open their eyes very widely to take in the 672 lb. pile, and others placed in competition with it.

Now, as our friend appears to enjoy figures, let me set him a little sum. As the 121 plants which gave the yield of 672 lb. of potatoes occupied exactly 4 rods, poles, or perches of land, what would be

1. The yield per acre in weight?
2. At 2/6 per lb. (mine were 3/) what would be their value in money?
3. For purposes of increase, how many eyes would the 672 lb. pile contain?
4. How much land would they plant at the same distances as the 121 sets were? And what would be the weight of the crop at the same rate of increase as before?

I think it is all very easy, and the results would be interesting. Some persons like "figuring things out," others do not; and as I am one of the latter ilk, and Mr. Lockwood of the former, his co-operation is cordially invited.

We will say nothing about the value of the crop under No. 4 head. It fell quickly and considerably after the sensational show, which the "Gardeners' Chronicle" well described as "one of the greatest horticultural farces ever put before the country."

All the same, I agree with Mr. Lockwood that the alliance of some of the American with British varieties has been advantageous, indeed, a few of the former are excellent in themselves; and certainly it would be difficult to over estimate the enormous value of the Red Skin Flourball when the disease was stalking rampantly through the land. It was the strongest of the strong and the bravest of the brave, and Mr. Lockwood has done well to keep its name in remembrance.

I intended to describe the manures used by Mr. Pink in the production of the biggest crop of potatoes that has been publicly exhibited in England, but must not press farther on space.—Pater.

THE ONION PICKLING INDUSTRY IN ENGLAND.

A few pointed facts about this industry appear in a recent journal of the Board of Agriculture. Owing to the Dutch and Belgian competition, English growers of pickling onions have been having a hard time, and the following facts are gleaned from a report furnished by a Board of Agriculture Commission. The Commission found that the Dutch onion growers lived on 2 or 2½ acre blocks, paying from £3/7 to £5 per acre rent per year, and 2/ to 3/6 per week rent for their cottages. Large families are the rule among these market gardeners, and the children go to work at 10 or 11 years of age. Wages paid to hired hands are as follows:—Men, 2/6 to 3/4; women, 2/; and children 1/ per day, and nothing found. The price of these "Silverskin" onions varies from 3/4 per bag of 110 lb. to 5/10, the factories bearing cost of bags and transport. At 3/4 per bag growers have lost money. The growers are a sober, hardworking class, very poor, and living mainly on bread, milk, and potatoes, and with a pig to fatten and kill and all vegetables required grown on their lands, they live a pretty hard life. After comparing costs of growing, handling, freight, &c., the Commission found that, although the Dutch growers worked cheaper their rents were higher than the English growers, and freights to London were about equal. The real secret of Dutch success lay in the better organization of the industry with regard to the brining factories and the better system of sorting and grading the product, combined with the humbler standard of living of the growers.

THE UNSPEAKABLE SLUG.

Why do not gardeners introduce a few "blindworms" into their slug-infested plots? These harmless English snakes (which are not snakes at all, says science, but legless lizards) are being constantly stamped out of existence by ignorant folk. who mistake them for adders. In reality blindworms are the gardener's friends, for their principal food consists of small slugs; and though they are easily satisfied in point of appetite, and devote a great deal of time to lying curled up in a hole in the garden wall or hedge, they may be relied upon to do some small amount of slug extermination. They make interesting pets, too, and quickly become used to handling.

Knowing how ruthlessly they are slaughtered in many districts, I have sometimes thought that if our horticultural lecturers would provide themselves with a genuine adder skin and one of the harmless slowworn, and exhibit the same to their audiences, carefully pointing out which is the gardener's friend and which the poisonous reptile, they would be adding to the good work already done by them in an educational way. An adder is usually much larger than a slowworm; the adder, too, has a distinct herring-bone pattern marking down the back, which is not to be found on any blindworm—or slowworm, as this harmless creature is sometimes called. He owes both these names to his habit of retaining his position on the patch of sunny road or hedge he has selected to bask in on the approach of a human being, and not to the fact that he has no eyes, or that those he has are of little use to him, for your blindworm can see very well. This is another point of difference between him and the adder, for the latter usually makes off, or more rarely attempts to show fight, on being disturbed. Blindworms are plentiful, and a dozen or so let loose in a garden will do nothing but good.—A Western Woman.

Vegetable Garden.

OPERATIONS FOR JANUARY.

(By W. S. Campbell.)

Agricultural Gazette of N.S.W.

The weather has been most satisfactory for vegetables, and, as the prospects for a good summer seem to be favorable, any kind of vegetables suitable for the warm season may be sown or planted as extensively as may be necessary.

There is one thing that should be carefully avoided during a moist, or, as it is often termed, a "drooping" season, and that is the digging up ground whilst it is very wet, and consequently puddling it into something like mortar. This refers chiefly to soil or loam that is more stiff than sandy, or "red soil," which can be dug with impunity even whilst it is raining.

The stiff, heavy soils may be greatly improved by heavy dressings of dung, or by liming, but the use of the two would probably be found the best method to adopt, not together, but applied at different times. The reason for this is, that if lime be applied with the dung it might liberate a good deal of one of the most important constituents of the dung. It would be as well to avoid the risk.

Tomatoes—Should be ripening well during the month, but where rain has been heavy, and the soil keeps damp about and under the plants, it is not improbable that the great pest of tomatoes, the black spot on the fruit, may be prevalent, although this does not always follow; for I have frequently noticed that during dry seasons fungus pests amongst vegetables and flower-garden plants were both common and virulent. Remove all diseased fruits or leaves from tomatoes or from any other vegetables which may be affected by fungus diseases, and then burn them.

Beans—With the exception of the Broad or Windsor bean, all other kinds, such as the French or Kidney, the Lima, the Snake, the Butter bean, with their varieties, may be sown as extensively as may be required during the month—not all at once, but several times during the month, and so on; then a continuous supply can be kept up. As soon as bean plants cease to produce their pods satisfactorily, remove them; and, after the ground has been well dug and manured, sow or plant some other kind of vegetable altogether.

Beet, Red—This is a good vegetable for summer use—cool and delicious on a hot day, and one which should be grown in sufficient quantity to keep up a good supply. Obtain the best seed procurable, and grow chiefly the Globe varieties, most of which are excellent. The seed generally takes a good while to germinate, as it has a hard coating or shell, which, botanically, is known as the pericarp derived from the two Greek words—"peri" around, and "karpos" fruit. As this pericarp or shell is hard, it takes some time to soften and admit the necessary moisture which, I may say, is perhaps the main factor in setting the slumbering life of the seed in motion, by making the soluble ferment, known as disastaste, active, by converting the starch which the seed contains into a sort of sugary matter or glucose or maltose. If the seed be soaked in water for a short time, or laid between a folded damp bag in a warm place, the germination will be hastened, and as soon as the seeds begin to crack they may be sown; but if the soil is at all dry, moisten it well before sowing the seeds in the drill, or they may perish. When the beets develop a few leaves, you may perhaps notice a few bearing leaves of a pale red color; if so, you may as well pull them up, for the chances are that the color of the roots will be a light red, which is very objectionable in this kind of beet. As a rule, however, beet seed turns out good and reliable.

Beet, Silver—A few plants of this kind of beet should suffice for an ordinary sized family, if it be well looked after, and occasionally treated to some liquid manure. When properly grown, the leaves will be large, succulent, and tender; but if the plants are neglected the leaves may become rather like leather when cooked. The seeds may be sown in a small bed, whence the plants can be transplanted to well manured ground when they have grown large enough to move, or they may be sown in drills, where the plants are to stand about 20 inches apart. Thin out the young plants to about the same distance, or rather more, apart.

Broccoli—Sow seed and transplant from previous sowing; manure heavily, and never allow the plants to receive a check if possible. It may not succeed very well at this time of year in the warm parts of the State unless the weather should turn out to be extremely favorable during remainder of the summer.

Cabbage—Mr. Ellis, of the Viticultural Station, Howlong, finds that the splendid cabbage, Phenomenal, succeeds best at that place if the seed be sown in January. St. John's Day is an old, well-known, and good variety, which probably succeeds better than any other cabbage during the average summer. Use plenty of manure for the cabbage, or for any of the cabbage family, for they are all strong feeders, and they all thrive best when the ground is kept well cultivated around them. Plant out a few young cabbages occasionally, and sow enough seed to keep a sufficient supply of young cabbages ready for transplanting or for pricking out.

Carrot—This is a vegetable that is always esteemed in the kitchen, for it can be put to many uses in cookery. It is said to be wholesome and also useful for various human ailments, but whether it is of any real value for such purposes seems doubtful.

Cauliflower—Sow a little of the best seed that can be obtained, and after sowing see that it is regularly watered and shaded and mulched to prevent a sudden drying-up of the soil, which may occur through hot winds at anytime.

Celery—Sow a little seed during the month, and when the seedlings are large enough to move prick them out a few inches apart and endeavour to make them grow into strong, hardy, plants, after which they can be transplanted to shallow trenches where the soil has been heavily manured. Advanced plants which are almost full-grown may be earthed up; or boards, dead leaves, or vine haulm, or anything of that nature, may be used to keep away the light from the leaf stalks. Grow the self-blanching kinds.

Celeriac, or Turnip-rooted Celery—Sow a little seed in drills or in a seed-bed. This can be transplanted like the ordinary celery, but it will not need blanching. Very useful for a change when cooked.

Cucumber—Seed may be sown if necessary. Keep the plants bushy by pinching the leading shoots occasionally. A little liquid manure will benefit cucumber plants which may be backward.

Cress and Mustard—Most useful during the summer for addition to salads. Liquid manure will be found useful to encourage growth, which should be as quick as possible.

Cress, Water—Can easily be grown without a pond or watercourse by anyone who likes to take the trouble of watering the plants once or twice a day. The tops will root quite well if kept sufficiently moist, and these can be planted in a small bed or in a tub or box, and if liquid manure be applied frequently and the plants be well watered the supply of cress that can be cut from a very few plants will be surprising.

Leek—Sow a little seed occasionally. Plant in heavily manured soil, for the leek is a gross feeder and needs abundance of rich food. It can be most easily grown in shallow trenches, like celery, and then watering and the application of liquid manure can be best applied. Plant out young leeks, a few at a time, so as to keep up a supply. A very few plants will probably suffice, for this vegetable, although an excellent and wholesome one, is as a rule but little used.

Lettuce—Sow a row or two occasionally during the month on well-manured ground where the plants are to grow. When the seed comes up thin out plants and encourage the quick growth of those remaining by cultivation—if necessary, watering—and the application of liquid manure. They will then be less likely to run to seed than if transplanted in the ordinary manner.

Maize, Sweet—This should now be growing well. Cultivate frequently, but not deep.

Melons—Should be growing satisfactorily this season. Pinch the leading shoots to keep the plants from straggling about too much. More seed may be sown if required.

Okra or Gumbo—Plant out seedlings that have been raised for the purpose, or seed may be sown. The young seed-pods of this plant are used for thickening soup or for adding to stews, &c., and is considered very useful for this purpose.

Onions—Cultivate the soil between the rows of onions, which should be growing satisfactorily by this time. More seed may be sown if necessary.

Peas—Sow a row or two occasionally. They will probably succeed best in cool districts.

Peppers or Capsicum—Plant out from seed-bed any plants that are large enough. There is a great variety of the capsicum, some kinds very small and intensely hot flavored and others extremely large and mild. Many kinds are grown for ornamental purposes in the flower garden, where they become handsome objects

Potatoes—Plant out a few rows if required. Early planted potatoes should be quite ready for digging.

Pumpkins—If any more plants are required sow a few seeds. New ground seems to suit pumpkins better than on old well-worked soil. Pinch back leading shoots to prevent the runners from rambling too much.

Radish—Sow a little seed occasionally, and make use of the plants whilst they are quite young and tender.

Rhubarb—If plants are not easily obtainable save sufficient seed to raise all that may be required.

Sweet Potatoes—Tubers should be planted in a warm situation, and as soon as the vines make sufficient growth cuttings should be taken and planted in a bed where they may root and make plants for setting out.

Spinach—Sow a very little seed.

Tomato—Should any plants be required, sow seed, or take cuttings from plants already growing if the varieties are all that are desired. These cuttings will strike root readily if they be inserted in moist sandy soil, and are covered by bell glass or glass frame, and are kept sufficiently moist without making the soil too wet or sloppy.

Turnips—Sow a little seed in drills.

Vegetable Marrow and Squash—Sow seed if required, and treat the same as melons and pumpkins.

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Answers to Correspondents

In consequence of pressure on our space we are compelled to hold over the second part of article describing Dr. Pooler's garden until next month.

"ROBERT E. DAWSON"—Thanks for your compliment. We shall adopt your suggestions re articles and illustrations as far as possible.

"A. E. BILTON"—The little book you sent is very interesting, and if such a series were brought up to date we feel sure they would be even more instructive than the one to hand. We are returning it, as requested, but should be glad if you could send us some seasonable extracts from it. We presume that the "Journal" published by the Royal Horticultural Society takes the place of these little books, but it is not in such a handy form. We shall be pleased to hear from you again.

"LIL"—The "Lyricofancy" of old writers is the May Lily (convallaria majalis), the Lily of the Valley, or Virgin's Tears.

"COUNTRY"—Old names of the Cowslip (Primula veris)—Paigle, Two in a Hose, My Ladies' Keys, Fairy Bells, St. Peter's herb, Cuckoo's boots, Palsy wort, Petty Mullein.

"SWEET VIOLET"—Herrick calls the Violets "maids of honor" to the Spring. Hood terms the Violet a "nun." Other poets refer to the Violet as modest, lowly, humble, bashful, languid. dim tender, darling.

"AMATEUR—Drayton calls the Gilliflower the "July" flower, a good example of popular etymology. The old name is girofle from the French, and is a corruption of the Greek karyou, nut, and phyllon, leaf, referring to the nut-like shape of the flower bud. Hence the botanical name Dianthus caryophyllus. The "clove"-pink is also from the French; clou, nail.

"PANSY"—If the estimation in which a flower is held is to be measured by the number of its pet names, the viola tricolor heads the list It is still called the Pansy (or hanging flower), in French Pensée (or thoughtful flower), and the Heart's ease; and was in times gone by known as the Herb Trinity or Constancy, the Paivnce, Ladies'-delight, Flower of Love, Three-faces-under-a-hood. Love-in-idleness, Johnny-jump-up, Call-me-to-you, Tickle-my-fancy, Jump-up-and-kiss-me, Kiss-me-ere-I-rise.

The Flower Garden

OPERATIONS FOR FEBRUARY.

There should be no want of flowers during the month if the present favorable weather conditions continue. Such a remarkably favorable season is most unusual, especially as, so far, there has been an entire absence of hot winds.

The foliage of many of the spring flowering bulbs is dying down, and as soon as it turns yellow it may be removed; and later on when the bulbs are quite at rest they may either be taken up and stored away in dry sand or allowed to remain in the ground without disturbance. Some of the tender varieties of annuals may be planted quite near these bulbs in order to fill up the gaps caused by the disappearance of the foliage.

Carnations of the perpetual flowering kinds, which are blooming well at the time of writing, are likely to continue to produce many flowers during the month. The Marguerite class will also probably be flowering well.

Dahlias are already flowering well in many gardens, and so far are producing good blooms. During January and afterwards there is likely to be a fine display. The old type of Dahlia is giving place almost entirely to the cactus varieties, which are extremely pretty and useful. The single kinds, too, are much in favor, and are extensively grown by some gardeners. Both these Dahlias may easily be raised from seed, and plants will produce flowers the same season. Should caterpillars be causing damage to any of the garden plants, spray the plants with Paris green and lime. Mix the Paris green with water, at the rate of 1 lb. Paris green with 160 gallons of water, and a handful of lime. Mix this thoroughly and strain for use.

Roses may be planted from pots, if good pot-grown plants which are not old and pot-bound can be procured. These are generally kept in stock by nurserymen, and probably many varieties are available. Should the soil not be moist at time of planting use plenty of water, and mulch with farmyard manure.

Remove all seed-vessels from flowering plants, such as Roses, Dahlias, Verbenas, Bouvardias, and others, and the plants will soon produce more flowers.

HYBRID TEA ROSES.

By Georges Bellair.

Revue Horticole, Sept. 1, 1903.

Guillot fils of Lyons seems to have been the first to try to cross Tea Roses with Hybrid Perpetuals. La France, which appeared in 1867, was the result of this attempt. Many amateurs rank it above all other Roses, and, in our country, it is certainly the favorite. Encouraged by this success, the following Rose growers, M. M. Peruet-Ducher, Schwartz, Guillot, Bouvaire, Robichon, E. Lambert, Vigneron, Ledechaux, Godard, Inpean, Nabonnand, Guinoisseau, Levet, and Peruet pere, in France, Dickson and W. Paul in England, Soupert et Notting and Ketten at Luxembourg, and Guillot fils himself, returning to the attempt, have raised other Hybrid Teas, which form, at present, a collection of over 300 varieties. The very first Hybrid Teas, however, seem to have appeared long before 1867, most botanists admitting that the complex group of Hybrid Perpetuals includes a certain number who must count among their ancestors besides the Tea Rose, or Rosa Indica, Rosa Gallica, and Rosa Semperflorens. What, however, particularly distinguishes Hybrid Teas of the La France type is the clear and striking appearance of certain characteristic features of Tea Roses, longer branches, often climbing, more refined color of the flowers, perfume usually delicate and distinct, lustre of the foliage, floriferousness, and a certain amount of hardiness, though not so great as that of Hybrid Perpetuals. By these signs it is possible to recognise the close or distant relationship of these Roses with Rosa Indica. It would be difficult, as yet, to make a complete list of Hybrid Teas since many varieties, raised during the last few years, are not yet proved. In the meantime we give a list of the best among the older Roses of this class:—First of all, La France. This is a type and is often painted, besides its soft color, its picturesque shape, its perfume, and its irreproachable carriage well deserve this favor. The Duchess of Albany is like La France; the same foliage, the same habit of growth, the same shaped flower, even the perfume similar, but the color a little deeper, and the carriage not so correct. This Rose nearly always bends over, the weight of the blossom being too great for the stalk.

Next comes Captain Christy, with flesh-colored petals, and stout, unbending stalk; Caroline Testout, rose color; Augustine Guinoisseau, white, tinted with flesh, much sought after for cut flowers; Madame Abel Chatenay, with flowers shaded with rose; Madame Joseph Bonnaire, china rose, whose large flowers are shaped like Paul Neyron; Rhine Natalie de Serbie, flesh, with cream colored heart; Aurora, salmon rose; Viscountess Folkestone, very floriferous, pale salmon, delicately perfumed, Madame Viger, rosy white; Rosomane Graveraux, a 1900 novelty which we particularly admired in M. Graveraux's garden at l'Haig, with silvery white flowers, barely tinged with rose; Triomphe de Pernet pere, red, dwarf, extremely floriferous, and a constant bloomer, which will probably play an important part as a Rose for baskets; finally, Kaiserin Augusta Victoria, whose pure white blooms will make a fortune for bouquet-makers and florists. To these varieties we may add all the small list of climbing Hybrid Teas, about twenty-five varieties, of which the best are—La France of 1889, Climbing Captain Christy, A. La France, A. Kaiserin Augusta Victoria, Monsieur Desir and Reine Marie Henriette. Hybrid Teas are treated like other Roses. They grow well from cuttings, except the naturally delicate ones, which do better budded or grafted, and the climbing kinds, which keep their climbing character better when not on their own roots. Hybrid Teas stand frost better than either Teas, Noisettes, or Bourbons. To sum up, the Hybrid Tea group is qualified to take an important place in our gardens, and to the varieties named here we shall soon be able to add many others, for Rose growers are working enthusiastically to raise more, and during the last three years 86 have been put on the market, 33 of these in the year 1902 alone.

POLYANTHA ROSES IN POTS.

These small flowering Roses thrive in the most satisfactory fashion in pots, either in the conservatory or greenhouse or in the garden, if stood upon slates or a bed of cinders to keep worms out of their receptacles. They make pretty ornaments at the doors of summer houses, along the fronts of shelters, even at tent openings, or beside the various seats. They can be carried indoors to adorn halls, staircases, window ledges, or the rooms upon any festive occasions. I have seen some used with charming effect upon a dinner table, but they must not be kept more than a day out of full light and air. Mignonette and Anna Marie de Montravel, pink and white, are two that may be relied upon; Paquerette is a very continuous white bloomer; Little Dot is another soft pink. Of crimsons I would choose Perle des Rouges, for it is extra dwarf and grows readily into a bushy shape, such as pot plants ought to exhibit. Lilliput is a most attractive shade, a deep cerise, or, as it is catalogued, cerise-crimson. Unfortunately, Perle d'Or is rather a strong grower for pot culture; I do not know of a quite satisfactory yellow. Mosella, a white and yellow, is pretty. Red Pet and White Pet are excellent.—M. Hawthorne.

THRUM EYE v. PIN EYE.

It is because the thrum eye is such an important article in the floricultural creed of the lover of a perfect Auricula, Polyanthus, and Primrose that I go so strongly for it. Therein I am in line with all the old florists from Adam downwards. I am by no means for casting out this body of sin from either of the flowers I have mentioned, as seed parents, provided all other requisite qualities are up-to-date. I have this season cross-fertilised an Alpine Auricula perfect in every point but the pin eye, which is scandalously obtrusive, while the golden anthers, like trunks, are at the bottom of the well of the tube. But I am looking for floral regeneration in some of the offspring, and among them my ideal Alpine Auricula, though I scarcely expect to get it. As I look at this pin eyed flower I see that the obtruding pistil seems to fill up the whole disc with a flaunting wantonness eclipsing every other good quality. The defect dominates and exasperates; the expression is vulgar, not beautiful; and therein you get forcibly expressed, I admit, my philosophy of the thrum eye as against the pin eye.

All the expression of the flower lies in the tube or eye; it is a positive virtue in the case of a thrum eyed flower; it answers to one's conception of what is truest and best in expression; it appeals to one's sense of beauty and fitness; its presence seems to light up the whole surface of the flower with modesty and grace. That is my belief. I was born into the acceptance of that article of belief, and in it I shall die.

In like manner I have to trust to pin eyed Primroses and Gold-laced Polyanthuses as mothers. I dare not eliminate them from my beds of seedlings, they have a distinct value as seed producers. I am merciless towards all inferior forms, because they are in danger of taking the progeny back to lower levels of quality.

I weep over the moral degeneration of the pin eyes, but like other evils they have to be endured. I have no hope of ever eliminating the pin eyed flower; I have no wish to do so, Nature would not permit it, she has something to say in the matter, and very properly too. If her greatest benignity be manifested in the production of pin eyed flowers, she provides comforting compensation in some beautiful thrum eyed blooms. I gratefully acknowledge her goodness. But as a florist of the old school I stand for the faith handed down to me by the apostles and prophets of a past floricultural age and creed. I carry my banner aloft and wave it; I am in earnest; I will not equivocate, I will not excuse, and I will speak!—R. Dean.

THE EUGENIAS.

These are ornamental shrubs of the Myrtle family. Eugenia myrtifolia soon forms a handsome bush, attaining a height of 10 ft. It bears a profusion of oval crimson berries with a single seed in the centre. The fruit is juicy, acidulous, and very agreeable to the taste eaten raw; but when boiled with sugar and the seeds removed, it forms a most delicious conserve of excellent keeping properties. The foliage of the tree is very aromatic, and is sometimes used like the tea by pouring boiling water over it allowing it to rest for a time, when it forms a very refreshing beverage.

Eugenia uniflora.—All the Eugenias do so well in the temperate and warm regions of these colonies, that there is no reason why this handsome shrub, with its white, myrtle-like blossoms, followed by its wealth of scarlet fruit, should not be in every shrubbery. When ripe, the fruit is juicy and piquant, and in this state it forms a conserve, which has a delightful perfume and flavor, like the conserve of Dog Rose hips. The seed grows freely in sandy soil on a hot-bed, and the plants, when they are large enough to handle, may be pricked off in pots for a month or two, when they will be ready to transplant to the borders. This fruit is the Brazilian Cherry, and will do well.

SLUGS AND SIGHS.

A little boy, in preparing an essay on "Slugs," said: "The slug is an animal without legs; that accounts for its being so slow. Its slowness, however, is only in movement. The way it can get round a flower bed and devour the best things is an eye-opener, especially as it is invisible when the flower owner comes along."

Yes, indeed! it is an eye-opener, and a mouth-opener to. These pestiferous prowlers must have heard that we were coming to our new garden. Previously there was nothing worth eating; but now —well, I should say the brutes came right through by the first express, bringing all their relations with them. I put up a notice warning them off, but they took no heed whatever. Rather did they let themselves go all out. It is slugs to the right, slugs to the left, slugs on the lawn, and slugs in the frames.

I have dusted with lime, I have dusted with soot, I snip every specimen of the gluttonous fraternity that I see, yet so many nooks and crannies exist that I almost despair.

Had I not taken the precaution to sow a potful of each sort of Sweet Pea, I should be wallowing in tears.

Why do not the demoniacal finches and starlings tackle the vermin instead of adding to my labors? And if they are incompetent, let the robins, the wood pigeons, the crows, the blackbirds, the linnets, and the wagtails have a try.

There is one consolation: A number of slugs found their way into other people's gardens instead of mine.—T. A. W.

NARCISSUS EMPRESS.

There is probably no Daffodil of the bicolor section that is a greater favorite than Empress, which combines in a marked degree the properties of refinement and size. The flower has pure white segments, of much substance, and a pure yellow trumpet that recurves slightly at the charmingly frilled mouth. Empress is one of the most vigorous of the whole section, and is suitable for pot culture, borders, beds, or naturalising in grass. The fact that Empress is an old variety which has not been superseded in these days of highly-priced novelties, speaks volumes for its excellence, and of the hold it has secured in general esteem. Nothwithstanding the new ones, I should still say plant Narcissus Empress.—D. W.

SAXIFRAGA GUILDFORD SEEDLING.

The introduction of Saxifraga Rhei has brought with it, in course of time, some lovely varieties, either seedlings or sports of it, and S. muscoides atropurpurea, of a better color than they. The term "better" is used in a narrow sense, inasmuch as it refers to depth of color alone, and is not intended as a disparagement of the pretty tints of S. Rhei. How many of these forms are really distinct I cannot venture to say at present, but one which has secured deserved praise is what is known as S. Guildford Seedling, a plant with the character of S. Rhei, but with deep crimson colored flowers. I have just been into my garden to look at it again before writing this note, and, making all allowance for one's enthusiasm, one can safely say that it is a charming thing, which will, in course of time, as the plant becomes larger, give the garden a fresh feature of interest and pleasure. It appears to resemble greatly one not yet generally introduced, which is called S. Fergusoni, though S. Guildford Seedling seems to have larger and more finely colored flowers. However, S. Fergusoni has not been long enough here to warrant a fair comparison. It seems almost superfluous to say that S. Guildford Seedling hails from that garden of hardy flowers at Guildford over which the late Mr. Selfe Leonard presided with so much enthusiasm and knowledge. It is of the mossy section, and easily grown almost anywhere.

SHOULD CYCLAMENS BE RESTED

My earliest experience of gardening was gained many years ago under a practitioner of the old school, who, gardener-like, had tremendous faith in the soundness of his own methods, but not much opinion of the ways of others if they differed at all from his own. The Persian Cyclamen of twenty odd years ago was not the flower it is to-day, yet the old gardener in question grew some fine specimens, and when the plants were in flower the greenhouse containing them was a sight worth seeing.

The process adopted was that of drying off and resting the plants after they had flowered. The supply of water was gradually lessened until it was stopped altogether, and after the leaves had died off the pots were packed carefully away, and the corms treated to their annual rest. I do not think it would have been possible to persuade the gardener that his favorite plants could be grown so well on any other principle than his own, though I am not sure whether he was aware that any other system existed.

A few years ago, however, he received a severe shock, and it happened in this way. He chanced to be paying a visit to a Cyclamen growing friend whose plants were a trifle better than anything he had ever grown himself. Gardener-like, he asked how they were treated, and was extremely astonished to learn that the magnificent results were obtained not by his own method of resting the plants after flowering, but by keeping them steadily growing all the year round. There is no creature in Christendom who is harder to convince than an old gardener, and it was not until the individual in question had proved for himself that the Cyclamen is amenable to any other course of treatment than the one he had followed so long, that he would have faith in the non-resting system.

Though opinions still differ as to the best means of growing Cyclamens, every year less faith is now pinned on the drying off and resting of the corms, which was at one time considered to be essential to success. In fact, illustrations prove that the Cyclamen is anything but a lazy plant, and does not want to sleep away a couple of months of the summer if the necessary conditions are given for keeping it growing. On the other hand, it enjoys activity, and if after flowering the plants are kept steadily growing through the summer in a cool frame, the way they respond in sending up flower spikes the following season shows how they appreciate the treatment.

Probably these lines will meet the eye of some champion of the resting process, and though he would be quite justified in taking up cudgels on behalf of his view, before doing so let me ask him to give the non-resting method a trial. I have been the means of persuading several incredulous Cyclamen growers to do it, and in no instance has one gone back to the old way.—Vernon.

THE SHASTA DAISY.

We have this season seen some lovely specimens of this flower, and we are now more prepared to endorse the rather extravagant praises given it in America in 1902 and 1903 than we were when it flowered 12 months ago. Some plants now in bloom at Mr. Michael Hawker's fine garden at Aldgate, in this State, certainly bear out most of the contentions of its introducer, Luther Burbank, of California. In our opinion it is destined to be one of the finest florist's flowers ever introduced. Long stems, thin and willowy, not thick and stiff like the Chrysanthemum leucanthemum. The yellow centre of the flower is small, while the outside rays of pure white petals are gracefully arranged, being long and in many cases slightly curled. The plants grow only about 2 ft. high, the flower stems rising straight from the clump of roots. It is in flower for several weeks from December onward. The further facts of its being a perennial and thoroughly hardy on the plains will further commend it to lovers of both good and new flowers. Many of the new things are simply new, and that is the best that can be said of them. That, however, is not the case with the Shasta Daisy.

ALYSSUM SAXATILE FL. PL.

In May gardens are bright with the mounds of yellow given by Alyssum saxatile, the Rock Madwort, which goes so well with the white of the Arabises and Iberises, and the purple of the majority of the Aubrietias in bloom at the same time in the rock garden. It is well-named, in addition to Rock Madwort, the Gold Dust, for the small flowers so closely covering the grey leaves look as if the mines of the Rand, Klondyke, and Australia had been called upon to yield their wealth to decorate our spring gardens. The common single Alyssum saxatile has few real rivals in this way in spring, but its floral duration is less prolonged than that of its offspring with double flowers, known in catalogues as A. saxatile fl. pl., a variety with blossoms of the same color, but lasting considerably longer in bloom, and standing the trials of bad weather in a better manner. Like the type, it prefers a rather light soil and a sunny position, and is nowhere so fine as on a rockery, where it will give an unsurpassed effect in its season. Its propagation is effected by means of cuttings, and for this there is nothing better than the good old-fashioned plan of taking the slips off with a heel of the old wood and putting them under a handlight, watering them well after making the soil about them rather firm. The glass should then be put on and shaded until there are signs of growth, when the air may be gradually admitted, and the plants exposed to the light. They can be put in their permanent positions in early autumn. I generally propagate as soon as the flowering season is over.—S. R. Nott.

TWO DWARF VERONICAS.

The country folk of East Anglia call the little wild Veronica officinalis, or Speedwell, by the expressive name of Bird's Eye. This wild species is perhaps more beautiful in color than our garden varieties, but in habit generally it does not compare with such a sort as V. rupestris. This dwarf plant, with flowers of an intense blue, is extremely useful in the rock garden, as it blossoms after the great mass of spring flowering subjects is past, and, therefore, comes at a time when its blue blossoms are very acceptable. It is one of the difficulties of the owner of the rock garden to provide plants that yield summer flowers, but in this little Veronica a grand one is secured.

It should not find a place among very minute and delicate subjects, or they may be choked and overrun, for this Veronica is a rampant grower. But give it a bold space to cover, or a great slab of rock over which to hang, and then, indeed, the mass of vivid blue is a sight to be remembered. I have never, however, seen this plant grown to such perfection as an edging as in a cold, heavy, clay soil. Small pieces were dibbled in one autumn. By the following June it had become a close dwarf edging, literally hidden by blue flowers. By the second autumn it had become 1 yard across; and now every year a sharp spade is taken, and it is simply cut away to the required width. This edging of blue is backed by the white Clove scented flowers of Mrs. Sinkins Pink, and behind that, again, the pink blossoms of that most desirable of all the Hybrid Tea Roses Caroline Testout. It often happens that the Veronica, the Pinks, and the Roses are in blossom at the same time, and then, indeed, the combination proves a most happy one.

The second dwarf Veronica that I would mention is the dwarf V. repens. Beautiful as it is, it always seems to me less acceptable than the foregoing, as it flowers considerably earlier, that is to say with the mass of spring subjects. But the dense carpet of green is so thickly covered with its exceedingly dwarf blossoms that it never fails to win admiration. One authority describes the color of the blossoms as milk white—if the milk happens to be watery that description very happily describes them. As an edging this plant is most useful for the spring display, or it may be used to carpet the ground between bulbs.—F. M. Wells.

NEMESIA STRUMOSA SUTTONI.

This is one of the most charming in the whole list of annuals. A subscriber has sent us a bunch of the flowers from a bed 20 ft. long and 3 ft. wide grown in the hills. In general appearance the flower is like a small Snapdragon, but the brilliancy of the dark shades is like that of the finest Calceolarias. They vary from deep velvety crimson through brown, bright red, bronze, orange, gambage, sulphur yellow, white, heliotrope, &c., with combinations of 3 or 4 colors in many of the flowers, some having sulphur yellow in the lower half, white in the upper, and tipped with heliotrope. We have never seen such uncommon and striking combinations of color in any other flower.

The plants grow to about 12 inches high. For the plains the seed should be sown early in the autumn, from April to June, and picked off into beds and treated the same as the Phlox Drummondi. A treat is in store for growers of this uncommon flower.

ROOF GARDENS IN EUROPE.

This fascinating form of gardening has become very popular in Berlin, Paris, and other large cities in the last few years, and in many cases it is done on quite a large scale. The houses are usually several stories high, substantially and in many cases artistically built. Although the streets are usually wide, the courtyards are small and cramped.

When being built the roofs are usually covered with zinc, on which wood, cement, and asphalt are put to prevent the water from entering the building. On the top of this, gravel to whatever depth required is put, and then earth from a few inches to a foot deep. Early in the summer annuals or bedding plants previously wellgrown on are then planted out, with here and there foliage plants in pots, such as Cordylines, &c.

PRUNUS PISSARDI.

As this note is being written Prunus Pissardi is in full bloom, and it seems an appropriate time to call attention to the fact that it is a pretty flowering tree as well as one which is appreciated for its dark foliage. It thus serves a double purpose in the garden, giving a host of small white flowers early in the year, and following that up by its striking foliage, so useful as a background to light-colored flowers. I was once greatly struck by the pretty effect given by a small grove of trees of Prunus Pissardi, rather thinly planted, which had between them a number of Doronicums. At the time I visited the garden the golden Doronicums were in full bloom, and the sun glinting down upon them among the dark-leaved trees made a wonderfully fine picture. It is not difficult to contrive many pretty effects without the use of more than one or two trees of the Prunus. As a "host" for a white climber, or in a border surrounded by white or pale colored flowers, it is delightful. It is not generally known that the branches of the tree cut when in bud and taken into the house will open in water.—S. A.

CAMPANULA VIDALII.

Vidal's Bellflower is a plant not too often seen in bloom in this country. This is not surprising, as it is one of the plants which are in the "no man's land" of gardening, being neither a hardy nor a greenhouse plant, and so destined apparently to linger in the shades of neglect, and to be seldom grown except in the cool greenhouse, where it is often crowded out by the more popular flowers of the day—an unmerited expulsion, for it is pretty enough to deserve a good home.

As a plant from the Azores, it can scarcely be expected to be hardy, and in this case one's expectations are fulfilled, despite the many attempts to cultivate it in the open in this country. There may be a few gardens in the south of England or in the Green Isle where it will survive most of our winters in the open, but it may be taken for proved that Campanula Vidalii requires to be grown either as a cold greenhouse plant or as one which can only be cultivated in the borders or on the rockery in summer.

It well deserves any attention it needs. It is a pretty plant, with thick, fleshy leaves, notched or serrated at the edges. It grows from 1 foot to 2 feet high, and bears racemes of rather creamy white, waxy flowers of a pleasing form, such as is seen in few other members of the genus Campanula, which comprises so many charming plants. It is altogether a distinct and pleasing plant, deserving a better fate than the comparative neglect under which it suffers.

Campanula Vidalii has been in cultivation for rather more than fifty years. It should have a rather dry and warm position when out of doors in summer, and when grown in a greenhouse is all the better for being placed outside for a short time after blooming. I may add that I have tried to winter this Bellflower in the open myself, but the plants always perished.—S. R. Nott.

GLADIOLUS VITALITY.

At a meeting of the Scientific Committee of the Royal Horticultural Society on October 21st, 1902, a spike of Gladiolus 3 ft. 8 in. high was shown. It was the growth from a corm which had remained out of the ground and neglected from October, 1900, to June, 1902, when it was planted. [Ed.—We know of such cases having occurred here in South Australia, where, after being 21 months out of the ground, Gladiolus bulbs have, when planted, grown and flowered.]

SOUTH AUSTRALIAN GRASSES.

By J. G. O. Tepper, F.L.S., F.S.Sc., &c.

(Continued.)

POACEÆ.

The Poaceæ are distinguished almost universally (according to Bentham) by the entire absence of a joint or articulation below the lower empty glumes, which, therefore, remain attached to the footstalk, while the seedbearing ones alone fall off. A second character, not quite so persistent, is that the staminate or male flower is always above the pistillate or female when the two exist on the same pedicel, which is not always the case. To this division belong the most important cereals furnishing food for mankind, such as wheat, barley, oats, rye, millet, rice, &c. It is divided into eight tribes by Bentham (Journal Linn. Soc., vol. xix., 75), viz., Phalaridæ, Agrostidæ, Isachneæ, Aveneæ, Chlorideæ, Festuceæ, Hordeæ, and Bambusæ, most of which have representatives among our indigenous grasses.

Phalaris minor, L., an annual and a close relation to the well-known Canary-seed Grass, has been introduced from Southern Europe, and represents the first of the above tribes. It is often found along watercourses, in fields and gardens, and is easily recognisable by its broad, long leaves, stiff, frequently geniculated or knee-joined stem, and its short, cylindrical, very dense ear or head: it is a very good admixture with the hay.

Ehrharta stipoides, Labillardiere, occurs along all our watercourses and gullies; also in most undisturbed fields with fairly loose and rich soil, but not in stiff red clays, and is one of our best fodder grasses, bearing close feeding within half an inch of the ground, and yet covering it almost entirely. If fed or cut close it forms short rhizomes, bearing rather broad soft leaves from one to three inches, but if allowed to grow rank it forms dense tufts, gradually increasing in size, and the leaves attain a length of eight to twelve inches or more. As they die successively the grass assumes a dried up, unsightly form, totally unlike itself in a vigorous state. If properly treated, after planting the stools rather closely, it proves a splendid lawn grass, far superior to those usually employed for the purpose, and survives the fierce heat of summer easily with very moderate watering. The stems are very slender, erect or procumbent, and from one to two feet high. The head forms a loose panicle, with distant, erect branches, is from three to six inches long, and very inconspicuous compared with most others. The spikelets, which are under half an inch, have six glumes, of which the outer persistent ones are short, the next pair long, narrow, and bearing awns, while the last are shorter and without awns. The single flower on each spikelet has four or two stamens, and is at the summit of the spikelet. Under cultivation the grass produces its flowers and seed almost all the year round, the principal season being during summer.

This species extends through all Australia and Tasmania to New Zealand, the other five Australian species being much more restricted.

Aristida Behriana, F. v. M., extends over the greater part of subtropical Australia, but not to Western Australia and Tasmania. It, and the five other species recorded for the province, is not now by any means conspicuous by its abundance, as it also has been largely replaced by the more prolific intruder Festuca bromoides, the Silver Grass, an annual which is now the most abundant grass on our fields and hillsides. The main distinction of the genus is the three-branched awn of the spikelets, and that of the species, that the comparatively short panicle (or head) is broad and dense, and its awns long. The leaves are narrow, usually flat at the base, but awnlike beyond, the upper sheath being rather broad and loose. The stem is usually under twelve inches, and the panicle two to three, and, according to Bentham, almost as wide. It is a very good fodder grass, but appears to be mostly of annual duration. Baron F. v. Mueller records it as occurring from St. Vincent's Gulf to the Murray and Lake Hindmarsh; the writer collected it about Ardrossan, Yorke's Peninsula. One species, A. hygrometrica, R. Br., is peculiar to North Australia, two others to New South Wales and Queensland, while the six South Australian ones are also found in the same colonies, and partly in Victoria.

Stipa elegantissima, Labill., introduces the true speargrasses, and is one of the handsomest, as the name implies, but not very important, as it only can subsist in the mallee and other scrublands, under the shelter of dense prickly shrubs, such as Styphelia patula, Hakea rugosa, &c., which effectively protect the delicate, truly ornamental grass against its enemies, the sheep and cattle. It is perennial, and when young forms small tufts, with soft, long, very narrow, and pointed leaves. The slender stems, branching and re-branching at every knot (or node) where also a narrow leaf, two or three inches in length, is placed—soon climb to the summit of the shrub, attaining a height of two to five feet, and develop there during August and September, their very loose panicles. These are several inches long, and composed of very numerous long and slender branches, densely beset with long, white, featherlike hairs. The short spikelets consist of three glumes, are brown, and bear a long awn, which also is beset with long but distant setæ. The fruit resembles (as in all the species) a spear (hence the popular name), and is composed of the upper glume enclosing the seed, about one-third of an inch long, and forms the sharply-pointed and barbed head, while the long awn, spirally-twisted part of its length, and bent when dry, forms the shaft.

The "Elegant Speargrass" occurs over all Australia, but is absent in Tasmania, althought it occurs at Kangaroo Island, from the seacoast at Queenscliffe to the higher scrublands.

Stipa flavescens, Labill., is a much coarser erect grass, also perennial, and two to three feet high when in fruit. The leaves are not very long, narrow, usually flat at base, but the rest rolled up, more or less rigid, and usually smooth. The panicle is narrow, dense, and six to twelve long when fully developed. The fruiting inner glume (chaff) is seated upon a long silk-hairy stalklet, and forms two teeth at the base of the awn, which is also hairy. The "Yellowish Speargrass," named from the color of its panicle, has been collected by the writer on Yorke's Peninsula, and is recorded from the neighborhood of Adelaide (Hallett's Cove?) and Fowler's Bay. It extends from Western Australia to New South Wales and Tasmania, but not in Queensland.

Stipa teretifolia, Steudel, is allied to last, the stems forming erect stiff tufts up to two feet high; the slender leaves are terete, or needle-like, but not very stiff, and as long or longer than the stems. The panicles are narrower, and the awns much shorter than those of the last species. It occurs at Kangaroo Island (probably also on Yorke's Peninsula), in Western Australia, Victoria, and Tasmania.

Stipa setacea, R. Br., is a tufted grass, with short, fine leaves and a slender stem, from one to two feet high. The ligula, or appendages to the leafsheath where the leaf is attached, are lengthened, and not bristly. The fruiting glume is much shorter than the outer ones, and velvet-hairy (hence the name). The loose panicle is up to ten inches long, and its awns to above two. It is recorded from Port Augusta, Crystal Brook, and the Murray, and extends over all Australia, and to Tasmania.

(To be continued.)

RED SPIDER.

This is a pretty constant annual visitor in some vineries at this season. It may be kept in check if caught in time by sponging with soap and water; pure hot water syringed on the foliage without touching the fruit is a more drastic measure, worth pursuing in bad cases. As a preventive, the hot water pipes should be painted from time to time with a mixture of sulphur, soft soap, soot, and water. It is most readily kept at bay in the case of peaches by means of washing the foliage daily with clean water. If spider does get a hold, hot water and soap must be used; it cannot be trifled with. Fumigation and evaporation by means of nicotine preparations are alike dangerous in the case of the peach.

A GARDENER WHO CLIPPED A BIRCH-TREE.

I have seen our friend the jobbing gardener commit a good few atrocities in my time, but I think one of him eclipsed all records a short time ago. He was called in to tidy up and do necessary work in a suburban garden, which was adorned by, among other things, two elegent Birch trees. Whether he thought that their pendulous elegant branches compared unfavorably with those of the mop-headed Acacias next door I know not, but I do know that he used knife and shears on them to such an extent that their size was reduced two-thirds, while their contour was such as an Association football might envy. Could vandalism farther go?—Regis.

WEEDS.

(A Paper read at the November meeting of the Hawkesbury Agricultural Society.)

By C. T. Musson.

Definition of Weeds.—Weeds are a remarkable (I had written misunderstood) group of plants. The ceaselessly persistent qualities they possess if found in man would merit unstinted praise. For have they not found the way to live everywhere and to multiply exceedingly in spite of our increasing attention to them and of all other obstacles?

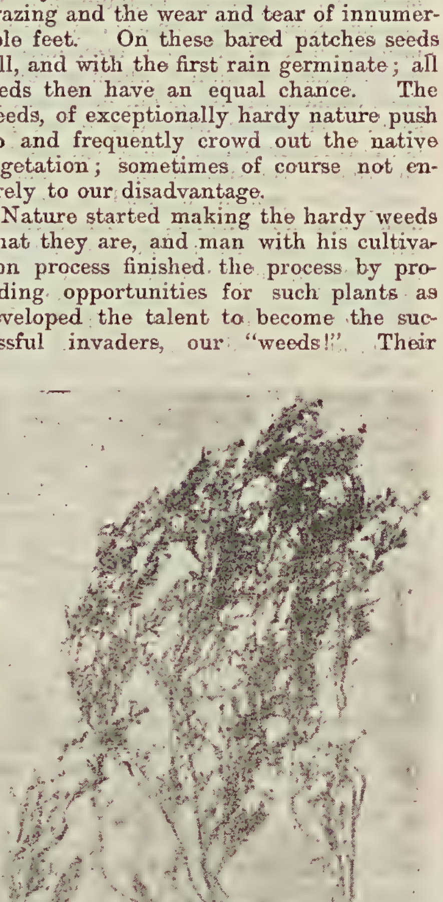
There is something in the definition of weeds given by one of our students. "Weeds are things which Adam had to contend with in the Garden of Eden for disobeying God;" if we read this, "weeds are things which man has to contend with in the great world's farm," we have a good working definition, and we may note that the weeds win or we must: there are no half measures in nature. Our attitude towards them should be that of a philosopher—they are here; they must be endured; but we must fight them, and we must win.

For practical purposes we adopt as the point of view from which to consider weeds that of a grower who requires soil produce in sufficient quantity (commonly understood as a large quantity), and of good quality (quality is often sacrificed for quantity; a mistake made by all except those who know the result). Our standpoint is therefore a personal one.

Now what do we really mean by the word "Weed?" It is necessary to get a definition as accurate as possible as to what plants are weeds, and why, and then consider which of them need our special attention; for many are neutral in their action. We may describe as "weeds," "any plants growing out of what we consider their home position, if they interfere with us in any way." Couch is a weed in the orchard, whilst in the paddock is a useful plant. Another good definition is "plants which tend to take prevalent possession of the soil used for man's purpose, irrespective of his will." Still another, "any uncultivated plant when troublesome." This latter we can take as our idea of a weed; and weeds are mostly herbs. It is an interesting fact that weeds are weeds in that they have been successful in resisting the adverse influences in life: they are the successful competitors in the plant race for positions as colonists; they are hardy, prolific, ubiquitous, successful travellers, not at all fastidious as to soil, situation, or food; they respond luxuriantly to the good things of life.

Consequent upon the mildness of our climate, and for other reasons, they have exceptional chances in this country; there is every opportunity here for pushing plant travellers to get a footing. In cultivating we make the ground bare: our native grasses are more or less of a tussocky habit, hence there occur numerous bare patches of soil between the individuals forming the plant covering. (Couch is a colonist of a kind; in early days it was not nearly so widespread as at present.) Animals make trees and fences their rubbing posts and lay bare the soil by trampling about them. Our stock routes are of soft ground mostly, and readily become bare under the influence of grazing and the wear and tear of innumerable feet. On these bared patches seeds fall, and with the first rain germinate; all seeds then have an equal chance. The weeds, of exceptionally hardy nature push up and frequently crowd out the native vegetation; sometimes of course not entirely to our disadvantage.

Nature started making the hardy weeds what they are, and man with his cultivation process finished the process by providing opportunities for such plants as developed the talent to become the successful invaders, our "weeds!" Their hardihood and numbers are due to special endowments which fit them for success in the battle of life. Possession of these endowments gives them an inherent power to seize every opportunity presented. These endowments have actually made weeds travellers; chief amongst the causes which have made them aggressive is the fact that they have means for ready and certain distribution; the seeds or fruits are constructed in such a way that they have exceptional facilities in this direction; for instance in the possession of a balloon-like attachment as in thistles and dandelion, or of hooks for attachment to animals, as in burr-plants.



Carrot-weed.

No doubt the increase of weeds is largely due to neglect from growers not being aware of their noxious nature and power of spreading and consequently leaving them alone, together with the occupancy of large areas of land and the absence of an "off" season when attention could be specially directed to their extermination or reduction.

If we are to understand weeds and adopt the right view as to their nature and action, we must first recognise the facts stated and grasp the idea that from the weed point of view they are the successful colonists amongst plants; this will help us in fighting them, for if we know the reasons why they are strong we can attack them at such times and in such manner as will prevent them developing their strength; thus they remain weak, without those special powers which render them strong to fix themselves and retain their hold.

Is the strong point seeding? Then we must prevent it. The Canada thistle produces 42,000 seeds, a mallow 16,500, sow thistle 19,000, pigface 100,000 (the numbers are approximations).

Is the possession of underground stems or tough root-stocks the strong point? Then we must prevent the plant digesting and breathing by not allowing leaves to develop, for they are the stomach and lungs of the plant.

It will be seen, therefore, that we strengthen our position if we know the habits of the various weeds; no two are alike, and the contrivances they possess of special use to their needs are as varied as the plants themselves. They all, however, possess one characteristic in common, perhaps the most important of all, adaptability; a remarkable ability to adapt themselves to any and every kind of surrounding.

In this country we have many remarkable structural features in the native plants which enable them to tide over the droughty periods—but the weeds are never in the rear; Nature's hard and relentless school in which it is live or die, has developed them as we find them to-day, pushing in and along anywhere and everywhere.

The Bad Points of Weeds.

In reviewing weeds we may recapitulate shortly the reasons why they are detrimental.

(a) They involve extra labor and may even bring about a change of rotation.

(b) They establish competition for food materials and light and smother out weaker or even useful plants; it depends largely on the stage of growth whether weeds smother the crop or the reverse, in some cases they do take complete possession of the ground and may thus crowd out completely everything else. We may note in passing that (other things being equal) weeds are hardy and prolific as compared with most cultivated plants, for the very fact of cultivation coddles the latter into a more or less weakly condition—chiefly because they are forced along one line of development to the suppression of other phases of the plant life, thus disturbing the natural balance; in such a condition plants become more liable to disease.

(c) Weeds encourage evaporation of soil moisture. The amount evaporated here in one year may be set down approximately as follows, based on the actual amount measured as lost from a water surface during 1902, and observation by Mr. Russell at Sydney Observatory:

Annual Rainfall Average.	Water evaporated from bare earth; surface constantly loosened.	Water evaporated from grass land, or land covered by weeds.	Evaporation from a water surface.
32 inches.	33 inches.	45 inches.	47 inches.

Of course there must be moisture to evaporate or the process slows down and may stop: the effect of plants on evaporation is, however, well seen in these figures.

(d) Weeds afford a shelter and food for injurious insects and plant parasites. The common wild cresses (pepper weed and wild carrot, for instance) are the hosts of two very injurious fungus parasites which attack cauliflowers, cabbages, turnip, and rape at times. Henbane is the host of a common and destructive tobacco disease. Hence we say, keep down these and such like doubly-detrimental weeds by all means in our power. Of course, we must know the weeds and parasites; herein is one important reason for gaining knowledge on this question.

Cat' Heads—bad weed in paddocks.

(e) Weeds add impurities to grain or green feed, of a prickly, sticky, or evil-smelling nature. Some are bad milk tainters, whilst some are poisonous or otherwise detrimental to stock. At the present time we have under investigation at the College a case of milk tainting resulting in serious loss from inferior butter. Also, another important case in the poisoning of some of our sheep, the suspected plant being the Yellow Rush Lily, a small introduced Iris.

Special value to Agricultural Societies attaching to a Consideration of Weeds.

Finally, an aspect of the question that brings you all into more active interest in the weeds, if such could be the case, is: What can you do in the matter besides the ordinary weed destruction that occurs during farm work?

There is much to be done, chiefly in three special lines of work, where co-operation would accomplish great results.

1st. Make a combined effort in the direction of trying to prevent the spread of the noxious weeds we have in the district already.

2nd. Interest yourselves individually and collectively in preventing the lodgment of any new weed in your district that is likely to be detrimental.

3rd. Plant no weed seeds.

To carry out the first point it is necessary to know what weeds we have, and which of them demand special attention. Several specially noxious things have newly arrived or are spreading in other districts; they need not spread here if forewarned is forearmed.

I therefore suggest that steps be taken through the members of this Society to obtain a census of the weeds of the district, where they are located, and their comparative quantity.

We shall be glad to receive at the College any collections or individual plants for identification and report, and are prepared to carry out all the necessary work in compiling the materials for such a census as is suggested. The children might be encouraged to keep their eyes open and their hands busy in getting specimens of all weeds.

Secondly, keep on the lookout for new things in weeds. You are the eyes and the brain of the agricultural producers of the district. Every day you look over an extensive area of land. Anything new to you should be immediately investigated as to its qualities. A dangerous enemy might thus be detected before too late, and a special effort made to get rid of it.

I know a parson in the States who wanted the fence round his church property painted. His people were not well off. They could not give much money, but they clubbed together, bought the materials, met one Saturday afternoon, and painted the fence. Why could not we do the same kind of thing to eradicate something which might be a menace to our district? No Agricultural Society should be so apathetic as to allow the sweet briar, for example, to begin, as a few plants scattered here and there in a few years cover many hundred acres, when a few willing hands could clear off the unwelcome intruders in a few hours. In this direction good work could be done by a Society taking such steps as were considered desirable in the interests of the community, even to the extent of holding a working "Bee."

Just now we are at an interesting stage in the weed question. The drought has, in the importation of stock food, brought in many plants new to the country; it behoves us to see that nothing detrimental gets a footing here. Of all places the roads and railways should be watched, for there the aliens commonly get a first footing.

The third point is one of equal importance with the other two. See to it that no weed seeds are planted with your crop seeds so far as it is possible to prevent it. We recently had under investigation a sample of wheat containing a large percentage of corn-cockle seeds. Such wheat, if the weed were not got rid of, would, if sown, give very impure results, and with this weed-seed admixed might, if used for flour, be positively dangerous to human life. This subject engages considerable attention at the College, and any seed sent for examination will receive prompt attention and report.

Docks.

Before sowing, then, always examine your seed carefully; if it contains weed-seeds, screen it and get rid of them; do not throw them out, but put them in the fire, or, better still, parcel them up and let us have them with all particulars at some convenient opportunity.

Should the Society feel disposed to act in the ways indicated I will ask permission to prepare a set of the district weeds with remarks indicating those needing special attention, for framing. Such a framed set hung in your meeting place would form reference material which doubtless would be of great use. The principal would be glad for you to consider that the College will act at all times in the capacity of Consulting Plant Doctor.

Bureaus for Weed and Seed matters would be an interesting and important departure from the old lines of work in such societies as yours. You would be in the greatest value to members as individuals and to the district in which they are located.

OUR WORST LOCAL WEEDS.

During the lecture members were asked to fill in circulars handed round with the names of the six weeds in their district, with the following result, plants being named in the order of importance they obtained in the voting. No. 17 is at present unknown to us. No. 18 must have been evidently named as a pest of the augurating new work that would prove of State—not being found here.

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BAD WEEDS.

	Common Name.	Latin Name.	Remarks Made.
1	Bathurst Burr	Xanthium spinosum	Burrs depreciate wool. Good for nothing. Hard to exterminate. Injurious to grazing paddocks. A great nuisance in horses' tails and manes.
2	Nut Grass, Pig Nut	Cyperus rotundus	Bad in cultivated land. A great plant food robber. Impossible to exterminate it. Will grow through and spoil potatoes.
3	Thistles	Carduus, &c , (several species)	Useless Spreads rapidly. In time takes complete charge of well grassed land.
4	Docks	Rumex, (several species)	Will slightly taint milk. Almost unkillable. Hard to deal with if allowed time before working through them. Useless for stock.
5	Sorrel	Rumex acetosella	Difficult to eradicate. Useless. Very persistent and rapid in growth. Chokes crops.
6	Balm Stagger Weed	Stachys arvensis	Useless. Dangerous to stock eating it. Causes weakness in working horses.
7	Saucy Bob, Thorney Dock Chinese Burr	Centaura calatropa	Absolutely useless. Very bad weed. Spoils hay.
8	Wild Carrot	Senebiera didyma	Milk tainter of the worst kind.
9	Blue Top, Mother Gunther, Cobbler's Pegs	Verbena bonariensis	Strong grower. Smothers all grasses. Useless for fodder.
10	Johnson grass	Sorghum halepense	Injures crops. Difficult to eradicate.
11	Cats' heads	Emex Australis	Very bad weed. Stock will not touch it.
12	Paddy lucerne	Sida retusa	Although stock will eat tops, is a bad weed in grass land.
13	Dandelion	Hypocharis (two species)	Said to produce stringhalt in horses. Smothers grasses.
14	Sweet briar	Rosa rubiginosa	Monopolises grass land. Difficult to get rid of.
15	Blackthorn	Bursaria spinosa	Monopolises grass land.
16	Dodder	Cuscuta epithymun	A lucerne destroyer.
17	Oil tree	?	Poisorous to stock.
18	Water Hyacinth	Pontederia	Impedes navigation.

PASPALUM DILATATUM.

H. W. POTTS.

The season this year has been especially favorable to the growth of this grass. So dense and prolific are they at this College that we have thought it well to illustrate three of the plots at different ages.

Plot No. 1 is near the piggery, and was planted the first week of September this year, and hence is only three months old. This crop is being cut for the pigs. They, especially the boars, eat it with great relish, and in it we find one of the most useful adjuncts to sty feeding we possess. It is cut fresh every day and thrown into the sties.

Plot No. 2 was planted in poor sandy loam in August, 1902, so that this plot is only sixteen months old. The growth here all through last summer's drought was vigorous, and a heavy crop of rich succulent feed was available in mid-summer.

Plot No. 3 has been planted two and a-half years, and throughout the two years' drought give us ample evidence of its drought-resisting qualifications. This season, when it reached the average height of 5 ft. 6 in., it was cut for hay, and gave a return of 18 tons 2 cwt. 1 qr. and 8 lb. per acre greenstuff, equal to 6 tons of hay per acre. The nutritive food value of Paspalum dilatatum is very high. Its succulence and palatability is unquestioned for any kind of stock, particularly horses, cattle, and pigs. Its richest growth is in early summer, and its succulence and greenness prevails throughout the summer. It will stand heavy stacking in summer, and provides green food when the majority of other grasses are dry, colorless, parched, and innutritious. In addition, whilst it displays a partiality for rich moist soils, our experience goes to prove that it will provide excellent fodder of great quantity on poor soils in dry areas. This season will bring into prominence the necessity for making provisions against fires in the paddocks. The luxuriance of growth in all directions points to great dangers during the warm weather. Fire-breaks will have to be made, all entailing expense.

This brings to mind the great possibilities existing in the growth of Paspalum dilatatum to act as natural fire-breaks. Instead of ploughing long strips of land year after year, why not plough and at the same time plant Paspalum? It is always green enough in summer to resist fire, and thus we secure the dual advantage of a summer grass and a fire-break. This idea was discussed in this "Gazette" by Mr. C. Robinson, and in Victoria two years ago, and the Railway Commissioners of that State are carrying out a series of tests along several railway lines to test the value of the grass in this direction.

Plot 1.—Paspalum at H.A. College.

ORCHARD NOTES

W. J. ALLEN.

Whether or not it would ever be possible to give to each grower just what he considers the correct quantity of rain to suit the requirements of his individual case is a conundrum which no person in the flesh can answer satisfactorily, as wherever you go you will find those who wish either that the rain would let up for a season or those who are praying for its appearance. Next to irrigation, it is perhaps the most vexed question of the day, because while few understand the former, we all know about the latter and can discuss it understandingly. There can be no doubt, however, that in many instances, the wet season has been responsible for a good deal of the damage which has overtaken many of the crops, and scab of the apple and black spot of the vines are undoubtedly flourishing under the existing wet conditions, yet I fancy there are not many of the stock-owners who are complaining of the over luxuriance of the growth this season.

The season has not only been wet, but it has been cool, and while those engaged in strawberry culture have little to find fault with, those engaged in growing apples, grapes, oranges, and peaches are compelled to fight the various fungus diseases with unceasing energy. As above stated, there is considerable black spot or apple scab on some varieties of apples. The Granny Smith appears to have suffered the most, while we find the 5-Crown Pippin fairly immune from it. I have visited orchards where, owing to the presence of this disease, the crop will only amount to about a quarter of what is usually harvested, and it is found that those trees growing in the lower levels are the worst sufferers. If the advice given in these notes from month to month had been followed and the trees sprayed in the spring and again after the fruit was well set, the loss from this disease would not have been anything like so great. In our Bathurst orchard, where we have a good many apples growing, we have not lost any fruit through scab, not even the Granny Smith, but the trees had all been well sprayed, which accounts for their good condition.

I regret to say that in most of the cooler districts the peach crop will be a failure, owing, I fancy, to the very cool nights in the early part of the season .

In many places the oranges did not bloom well, more particularly the seedling varieties, and in consequence the crops will be light in these places, while in other districts the crops of this fruit are the heaviest for years.

It is well to keep the orchards thoroughly cultivated and free from weeds; this, of course, does not apply to those on steep hillsides in districts where the rainfall is heavy throughout the summer.

Where apples are growing see that the bandages are looked at regularly, and all moth-infested fruit picked up and boiled or fed to pigs; and it is not too late to give the tree a spraying with arsenite of soda or Paris Green to help keep the codlin moth in check, as at this season of the year it will be found very active, and the orchard must receive every care if the grower expects to harvest much clean fruit. In every apple-growing district which I visit five out of every six growers are praying for a Pests Bill, and say they will never do well until they get it.

At time of writing these notes it is too early to say whether we will be troubled with the fruit-fly, but should it make its appearance see that all fly-infested fruit is picked up and boiled, so as to keep this pest under as much as possible.

Wherever a tree is found growing too thick it might with advantage be thinned out, cutting back the superfluous growth to within three inches of the main branches, so as to encourage it to develop fruit spurs in the proper place. Trees found going to wood and not bearing may be headed in, thus lessening the winter's pruning to a certain extent, and at the same time helping the tree to throw out fruit buds.

Some of our best drying varieties of peaches will ripen towards the latter part of this month, and I advise those who intend drying any to see that they are thoroughly ripe before they are picked, then cut in halves and placed in the fumigator for two or three hours. If dried in the sun see that they are kept free from dust, as nothing damages the newly-cut fruit so much as a coating of dust. Early Crawford and Elberta peaches make excellent bottled fruits, and for those who intend to process them in this way I would recommend the use of these varieties. A good syrup is made by mixing 4 lb. of best brewers' crystals to the gallon of water. After boiling for twenty minutes, strain and allow to cool, then, having peeled, halved, and packed the jars tightly with the fruit, fill up the bottles with the cold syrup; place the tops on the bottles, but not the rubbers, then place them in a copper, arranging them so that they can neither touch the bottom, sides, nor each other, using either strips of wood or cloths for the purpose. Fill the copper with cold water to a depth of three-quarters the height of the jars, and light the fire under the copper. After the water comes to a boil, cook for from 20 to 30 minutes, according to ripeness of the fruit, then remove from the copper and fill each jar to overflowing with boiling syrup kept on one side for the purpose. Put on the rubber rings and screw on the tops, and allow to cool slowly before storing in a cool place.

See that all fruit intended for market is well graded and packed so as to present a good appearance when opened up. If the variety is inclined to be soft and easily bruised, pick a little on the green side so that it will not be over-ripe and bruised when it reaches the consumer.

American fruits have landed in Sydney in good condition during the last few months, the plums and peaches being packed similarly to eggs, and in such a manner that it was almost impossible for them to become bruised in transit. The principal fruits imported were apples, peaches, plums, pears, and grapes.

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Farm-yard or Stable Manure.—This is a general manure, and contains all the elements requisite for the tree's growth; as a general rule, it is very much neglected in these colonies, and in no case have I seen it taken anything like the care of that it deserves. If kept at all, it is usually thrown into the heap anyhow, and exposed to all weathers, so that when used its manurial properties have often been washed clean out of it. Farm-yard manure to be properly made should be thrown into a heap, which should be protected from the weather, and no soakage should be allowed to run from the heap. The heap should be turned, so as to prevent the manure from burning, and to mix it, so that it will rot properly and evenly, as a well-made heap of farm-yard manure will cut out like cheese, even when there is a large amount of litter mixed with the urine and dung of the animals producing the manure. When farm-yard manure is well made and thoroughly rotted there is no fear of any weeds growing from it, but when thrown into a heap anywhere, or used fresh, stable or farm-yard manure is a frequent source of weeds. If, when turning the manure heap, it is found to be at all dry or musty, then it is necessary to damp it, either with water or, better still, with liquid manure, when a proper rot will take place. Where the soil is at all heavy, farm-yard manure has a very beneficial effect when ploughed in well or only partially rotten, as the manure tends to lighten the soil and keep it more open Farm-yard manure should be applied to the soil by being spread on the surface and then ploughed in. For orchard purposes it should be applied at the time of the winter ploughing.

Instead of destroying all waste materials about a place, such as weeds, leaves, cleanings-up of road ditches, &c., it is a good plan to compost them with lime, when, if well turned and rotted, they will form a valuable manure for spreading round trees.

In soils deficient in nitrogen and organic matter the cheapest way to make good these deficiencies is by green-crop manuring, and for this purpose the best crops to grow are—cow peas, field-peas, vetches, red clover, and Trifolium incarnatum, which should be ploughed in when the pods are forming; but before the seed is sufficiently advanced to germinate. All leguminous plants have the power of obtaining nitrogen direct from the atmosphere, and of storing it up in their roots, and this is especially the case with the cow-pea; so that when these crops are ploughed in they add a large amount of nitrogen to the soil, and in the case of heavy soils the organic matter tends to open up the soil and render it more friable.

There are other sources of manure that should not be neglected, of which fowl-manure and nightsoil are especially worthy of conserving. Nightsoil should be mixed with dry soil, charcoal, or peat, and it can then be placed directly round the roots of the trees, and will produce very beneficial results.

Mulching.

This is an operation that is not given the attention that it deserves, for though no doubt the mulch forms a harbor for various noxious insects, there is probably no better treatment for keeping the trees healthy and vigorous. Mulching tends to keep down weeds, to keep the roots cool, and to retain moisture in the soil for the tree's use, as the absorbent properties of the soil for water are increased by the addition of organic matter. On poor white sandy soils mulching is of especial value, as the heat is radiated from such soils to such an extent as to often scald the trunk and main branches of the tree; mulching prevents this radiation. Very heavy soils are also greatly benefited by mulching, because in dry weather they are very apt to cake and become exceedingly hard; this is prevented by mulching.

Mulching is good for citrus trees of all kinds; in fact, there is no better treatment for this class of fruit-trees. The operation may be done by means of bush rakings, consisting of more or less decomposed leaves and branches, fine top soil, compost of any kind, stable manure, rotten straw, rotten weeds, or corn-stalks. If there is a difficulty in obtaining suitable material for mulching, then it will pay to grow a crop of peas, cow-peas, or other strong-growing leguminous plants, which should be cut when coming into pod, and placed round the trees. Leguminous plants, besides acting as a mulch, are a valuable manure on account of the quantity of nitrogen they contain.

Thinning.

No tree should be allowed to bear more fruit than it can mature to perfection; hence the necessity for thinning over-laden trees if you want to get large fruit. The following, from Mr. Benson's articles on apricots and apple culture, shows how these fruits should be thinned. The thinning of other varieties of stone-fruits is done in a similar manner to that of apricots, only that peaches are allowed more room, and smaller fruit less. Small varieties of plums or prunes will not pay to thin. Pears should be thinned when necessary.

Thinning Apples.

Where the trees are heavily overladen, the fruit should be judiciously thinned, so that the fruit that remains may have a chance to attain a fair size and develop properly, as it will then be more saleable than the undersized fruit from an overladen tree, and the tree itself will not be injured by the weight of the fruit breaking limbs, or, as sometimes happens, by splitting the main trunk, thereby seriously injuring, if not actually destroying, the tree.

In the case of many of the earlier varieties, especially cooking ones, the fruit may be allowed to develop to a sufficient size to be saleable, and then thinned, the balance of the fruit being allowed to come to maturity. In all other cases where the trees are heavily laden, and unable to properly develop all their fruit, they should be thinned as soon as the crop has properly set, and there is no further chance of any fall taking place. The amount to be thinned will depend on the kind of fruit, the nature of the soil, age of the tree, and the brittleness or toughness of the wood, as different varieties of apples vary very much in this. With large cooking varieties the thinning should be severe so as to produce a large-sized fruit, yet not to severe as to produce oversized fruit, which are usually of little value, being soft and coarse. With dessert apples, where a medium-sized fruit—that is to say, a fruit not exceeding 3 inches in diameter—is required, it is not necessary to thin so severely, but as many fruit should be left on the tree as the tree is capable of growing to perfection, without breaking down or otherwise injuring it. There is another danger from over-cropping that I have omitted to mention, and that is the danger of opening the head of the tree too much by the weight of the fruit spreading and bearing down the branches, thereby exposing the inner parts of the tree to the direct action of the sun, which, striking right on the unprotected bark, is often the cause of sunburn which is usually the immediate cause of several diseases, notably scald, or, as it is generally called, fire-blight.

Gathering.

Simple as the gathering of fruit seems, it is nevertheless a very important operation, and one that it will pay the growers to attend to thoroughly, especially where the fruit has to be sent some distance to a market, or where it is intended for export or for storing for our own local markets. Always gather the fruit carefully, bruising it as little as possible, as a bruised fruit is always a blemished fruit, which detracts from the appearance, and consequently the selling value of the whole case; and in the case of most varieties of fruit, bruising produces an early decay. Even where there is a market for the fruit as soon as is gathered, handle it carefully; it will both look and sell better. Except in the case of early and some varieties of midseason apples, which can be gathered and marketed when only partially ripe, all apples should be allowed to remain on the trees till fully grown, in order to develop their full flavor and quality, which will be matured by storing. Keeping varieties of apples, if gathered when immature, will always shrivel; but early varieties, when left on the trees too long, will become dry and mealy. Actual experience is the only means by which the grower can determine the exact time or stage at which to gather the fruit, as variety, soil, and climate have always to be taken into consideration; but a good general rule to go by is—gather early fruit before thoroughly ripe or it will become mealy, but allow late varieties to become thoroughly developed or they will shrivel and not mature their full flavor when stored.

Pears should be gathered as soon as they have lost their woody flavor and have developed sufficient sugar. They should never be allowed to soften on the tree; if so, they will be either dry and mealy or rotten at the core, or both. Peaches, plums, nectarines, &c., should be gathered before they soften, even for the local market, as they are so easily bruised. When required for shipping to other colonies, they should be gathered even sooner, and only the firmer varieties should be sent; but where required for drying, the fruit should be allowed to become quite ripe. The following, which was written especially with regard to apricots, applies to peaches, prunes, plums, and nectarines:—

"The purpose to which the fruit is to be devoted determines the stage of ripeness at which it should be gathered. When required for drying it should be allowed to become thoroughly ripe, but not dead ripe or mushy, as then it will not keep its shape when cut, and if gathered too green the fruit will dry light and be acid, as the sugar is not fully developed. For canning, the fruit must be gathered while still firm, just before the softening takes place, or it will not keep its shape whilst cooking, and for shipping long distances or for pulping it must be gathered even sooner. In gathering the fruit do so carefully, and don't bruise it any more than you can help. Use step-ladders; don't get into the tree if you can help it, as if you do you destroy numbers of fruit-spurs along the main branches or just where the tree can bear most fruit without injury. Some Californian fruit-growers advocate shaking the fruit off into large sheets in a similar manner to prunes, but I don't like it, as it bruises the fruit too much; for, though it works well with prunes, which have a tough skin, it spoils other kinds of fruit. The expense of picking is made good by better market returns. When gathered for drying, the fruit should be carried in the picking-boxes direct to the cutting-tables, so that there is as little handling as possible, and where the cannery is close to the orchard the same method should be adopted."

Thinning Apricots.

No fruit requires more careful thinning than the apricot, nor will pay better for careful thinning, for if allowed to overbear—a very common occurrence in this colony—the trees will produce a large number of small fruits which are nearly all stone, and which are of very little value; whereas, had the same trees been properly thinned they would have produced fruit of good size, that would have been valuable for canning, drying, or selling fresh. There are two ways by which the fruit can be thinned, the first of which is to so prune the tree in such a manner that no more fruit-wood is left than is sufficient to produce the quantity of fruit that the tree is able to grow to perfection, and the pruning that I have described in the previous part of this article shows how this can be done. The second way is to thin by hand as soon as the last drop is over—that is, after the drop which occurs when the stone is forming has taken place. Sometimes this drop is sufficient thinning in itself, in which case it is not necessary to thin further; but if too large a quantity of fruit has set, then it must be thinned. No hard-and-fast rules can be laid down for thinning apricots, the quantity to be left depending on the soil, climate, and the vigor of the tree. In some cases at least three-quarters of the fruit must be removed; and even then the tree will have as many fruits left as it can mature properly; whereas in other cases only a very slight thinning, or none at all, is necessary. The more vigorous the tree and the better the soil the more fruit it is able to mature. The fruitgrower must use his own judgment in the matter, and if he is an observant man he will soon learn how much fruit the tree is capable of producing properly, and when and how much a tree requires to be thinned.

In thinning, gather the fruit; don't knock it off with poles. Pull off all the smallest fruit, and thin evenly all over the tree, not all on one side and none on the other. Thinning pays well, as 200 lb. of good fruit on a tree will sell for more money than 500 lb. of rubbish, which is hard to dispose of at any price. There is another great consideration in thinning the fruit, and that is that the strain on the trees' energies is very much lessened, and the plant-food removed from the soil by the crop is very much less, as it takes much more out of the land to form the stone than it does to form the fleshy portion of the fruit, because the kernel of stone-fruits always makes a heavy call on the soil for phosphoric acid and nitrogen, the two principal plant-foods that have to be kept up in the soil by manuring. Thin a few trees to see whether it pays or not, and I have little doubt that you will continue to thin, as the increased size of the fruit renders it much easier to dispose of, and the extra price obtained will more than pay for the expense of thinning.

Now, if "Pater" puts on his spectacles—as those South Kensington judges did after they had got their eyes opened—he will find in my first reference that qualty and the credentials of the raiser were taken in combination. Better by far one good 65-pounder that will feed half-a-dozen street arabs than South Kensington Hall full of clodwollopers not fit for the pigs.

"Pater," like Pope, wants me to lisp in numbers, and this when the pleasant season allures, and the garden invites attention! I cordially agree, however, to let the numbers come; they may be instructive as well as interesting to readers. 1. 121 plants, occupying 4 rods, produce 672 lb. What weight per acre? 12 tons. 2. Value per acre at 2/6 per lb., £3,360 (pounds). 3. How many eyes per pile? 81,312. 4. Land planted same distance as 121 sets were, and weight of crop—16 acres 3 rods 8 poles, and 201 tons 12 cwt. respectively. "Pater" says it does not matter about the value of the last item, as it dropped considerably. Here it is, as previously stated—£56,448.—B. Lockwood.

BIRDS ON THE LAWN.

If the indefatigable "T. A. W." had paused during his slavery for a moment's inspiring respite, and cut out a piece of the turf for examination, he would probably have discovered the cause of the presence of starlings, wagtails, and robins, for they were annihilating the voracious cockchafer grub, which is without exception the most destructive underground foe we have. The damage these grubs do in fields, lawns, and gardens is almost incredible. After the young are hatched they remain in the ground three years before they become perfect beetles, and during the larval period they totally destroy all vegetation they come in contact with, and have been known to ruin a harvest. Without the assistance of our feathered friends man would be helpless, for destruction would be complete ere the discovery was made. I once saw a field where you could take the turf and roll it up just as if it had been cut and pared. It is most interesting to observe the birds after their prey. They fly down, hop about, and listen most intently with their clever heads laid lown and on one side, and instinctively they bore into the ground in an instant, and in that moment have accounted for one foe. Unfortunately, the mischief of the cockchafer does not end with its larval stage, but when it comes to a perfect state its havoc with foliage is as great as it was with the roots.—R. E.

ABIES NOBILIS VAR. GLAUCA.

Abies nobilis is one of the finest of the many fine Conifers discovered by Douglas, who was sent out collecting by the Royal Horticultural Society of London about seventy years ago. In places where it does well in this country it makes a very handsome plant, the trunk being tall and straight, and furnished with branches from top to bottom.

In its native habitat it grows to a height of 300 feet, forming large forests. It is found in Oregon and California, and was introduced in 1831. The specimen shown in the illustration will be seen to be in cone. The cones are borne in an upright position on the branches, and are from 4 to 6 inches long, and 2 to 2½ inches in diameter.

The variety glauca has more silvery leaves than the type, and is of stronger growth. In various parts of the British Isles fine specimens of both the type and the variety are to be found, some being 70 or 80 feet high, with a girth of from 5 to 7 feet.—D. L. More.

Vegetable Garden.

OPERATIONS FOR FEBRUARY.

W. S. Campbell.

Favorable conditions for vegetable growing seem likely to continue during January, and in all probability, unless some sudden change takes place, the present summer will probably be the mildest experienced for many years. The occasional showers keep the ground sufficiently moist for vegetable requirements, and no farmer can have an excuse for being without an abundant supply of these necessaries, for, during such a season, the growing of vegetables is a comparatively easy matter, the most difficult work in some localities being the prevention of the growth of weeds, which run up so rapidly as to outgrow and injure, and, perhaps, destroy young vegetables unless the weeds are removed in time.

Pull up everything that is not likely to be productive or profitable, such as old peas, beans, cabbages, and other vegetables which have run, or have started to run, to seed. Strawberries, which are generally grown in the vegetable garden, are likely to send out runners from all sides, and if some good plants are required for putting out in new beds next autumn, take the opportunity of selecting the best of the suckers, which will probably be found next to the mother plants, and in removing all others. As soon as the suckers have become well rooted, separate them from their parents by cutting the connecting links. Should the weather continue favorable, the young strawberries, if nicely rooted, may soon be planted out, without waiting for the autumn, and it is quite possible that some of them may bear fruit before the winter sets in. When planting, or, rather, after planting, tread the soil well about the roots and spread a mulch of dung all around the plants, as it is quite possible that some hot, dry weather may set in after all; although there may be a risk in planting, it is worth chancing, for so much time may be saved.

Beans.—Any kinds, except the Windsor, or broad bean, may be sown as extensively as may be required. It would not be advisable to sow beans on the same ground from which beans of any kind or peas have just been removed. It would be much better to try cabbage, or, better still, some roots, such as carrot or turnip, and the soil would have a complete change. By constantly growing the same kind of vegetable, or vegetables belonging to the same natural order, as it is called, on the same piece of ground, not only does the soil become "sick" of them, but vegetables pests, inects, and fungi, which are common to the natural order, have a much better chance of thriving and increasing than would otherwise be the case. Try some of the runner beans, if sticks or other supports can be provided for them. These can be sown either in single or in double rows, about a foot or so apart. The little labor entailed in fixing up supports should not deter anyone from growing a few rows of these beans.

Broccoli.—Sow a little seed of this vegetable, which is much the same as cauliflower, but rather coarser and hardier than that variety of cabbage. Like the cauliflower, it requires good, moist soil, well drained, and it is always advisable to use a good quantity of manure and thoroughly incorporate it with the soil when preparing for planting. This vegetable should be grown without a check if possible.

Borecole, or Kale.—This is a good vegetable, but, strange to say, but little grown in this State. It is worth a trial, particularly by those who live in the cool parts of the country. This is another member of the cabbage family, and needs much the same management as cabbage, applying abundance of manure to the soil, unless it be naturally very rich. Sow a little seed.

Cabbage.—Sow seed occasionally—just a little—in order that a supply of plants may be available for pricking out, and for planting whenever required. Sow the seed in drills, in a small seed bed, quite thin. The generally adopted but erroneous method of sowing cabbage seed is broadcast, as thick as possible, with the result a miserable lot of lanky-looking plants, to be hauled out by the handful when required for planting. Mr. Ellis, of the Viticultural Station, Howlong, finds that the variety known as Phenomenal succeeds best if sown during January. Well-grown plants which are ready should be planted out.

Cauliflower.—Treat as recommended for broccoli. The seed may not, perhaps, come up so well as the broccoli, for it is a difficult matter sometimes to procure good cauliflower seed. It is worth while paying top price for the small quantity that is likely to be required.

Cucumber.—Seed may be sown in any part of the State if plants are required, and during such a season as the present the growth of the cucumbers should be most satisfactory.

Celery.—This should be growing very well under the favorable weather conditions lately prevalent. Sow a little seed. Prick out advanced seedlings, and plant some of the pricked out well-grown seedlings. Earth up any plants which are nearly full grown, taking care not to drop any soil within the leaf stalks.

Cress and Mustard.—Sow occasionally during the month to keep up a supply. These salads should attain great perfection with showery and cool weather.

Egg Plant.—Probably a sufficient supply of seedlings have been planted. But should any more plants be required, sow a little seed, which should soon come up after sowing.

Maize (Sweet or Sugar).—Advanced plants should be sufficiently well cultivated to keep down all weeds. More seed may be sown if a further supply is required.

Onion.—A little seed may be sown if an additional supply be required. Seedlings which are coming up above ground should be kept quite free from weeds. The weeding must be carefully done or the little onion plants may be pulled up with the weeds if they are thick. In small vegetable gardens the system of sowing onions for transplanting is a good one, and if carried out a good deal of trouble may be saved in the way of weeding, seed sowing, &c. The seed can be sown in small beds, or in boxes if this should be more convenient, and when the onions are large enough to shift they may be planted out. If the soil is at all dry, the onions should be well watered after planting.

Parsley.—A little seed may be sown if there are no plants in the garden.

Peas.—The season is all that could be desired for the pea. It will probably be found that the vines have grown much taller than usual, and, unless sticks have been provided sufficiently tall, the peas have grown into a tangle. Those vines which are allowed to grow over the ground are even worse, and are liable to rot and die off, and a good deal of loss is the consequence. Some kind of support should always be provided for peas and other climbing vegetables. A few seeds may be sown two or three times during the month, or when space is available.

Potato.—Plant out a few rows of this most useful vegetable. Use abundance of farmyard manure, and mix it well with the soil as digging is proceeded with. When planting, try spreading a good layer of dung along the bottom of each trench, and plant the potatoes on the dung. Give the plants ample space in which to grow. The rows may be made from 2 feet 6 inches to 4 feet apart. Lay the sets about 1 foot apart in the rows, and let them be covered about 5 or 6 inches deep with soil.

Pumpkin.—The plants should be spreading well over the ground by this time; but should a sowing have been overlooked, seed may be planted at any time convenient, and a good crop is likely to follow.

Radish.—Sow a little seed now and then to keep a supply going.

Spinach.—Sow a little seed.

Tomato.—If any more plants are required, seed may be sown, or seedlings already suitable for moving may be planted out. There should be a good show of fruit by this time in many parts of the State. Plants which have been allowed to spread over the ground are not likely, during a moist season such as the present, to ripen their fruit satisfactorily; they should be trained to stakes or other kinds of supports. There are various methods of training adopted by different growers. Some train to a single stem, pinching off lateral shoots as they start into growth; others train, allowing the lateral shoots to develop, and so on.

TOMATO FORCING UNDER GLASS.

In the Illinois Experiment Station bulletin for November, 1902, some interesting results are recorded about tomato culture. It was found that tomato plants might be had in fruit 50 days after benching, and 128 from sowing. The main points tending to success seem to have been—1st, checking the plants by growing in 3½ in. pots until ready to plant out, so stunting them when they should be showing open blossoms and be very much pot bound; 2nd, planting so as to allow as much light as possible to reach the plants; 3rd, hand fertilising. The pollen is shed only on bright days, and should then be collected and placed on the stigma; 4th, careful selection of varieties. Plants trained to a single stem gave better results than those trained to three stems.

The yield for the winter and spring was from 2 to nearly 2½ lb. per square foot of bench, or from 7 to 9 lb. per plant. 51 plants seed sown on August 20th yielded as follows:—December, 52 fruits, 7½ lb.; January, 131 fruits, 22½ lb.; February, 399 fruits, 80 lb.; March, 494 fruits, 104 lb.

EVAPORATION OF WATER FROM SOILS AND SOIL MULCHING.

The Wyoming (U.S.A.) Experiment Station, in some experiments recently conducted there, report that when the water level in the soil was kept at 22 inches below the surface, stirring the surface once a week to a depth of 2 inches retarded evaporation by 19 per cent., hoeing to 4 inches by 23 per cent., and to 6 inches by as much as 43 per cent.

TOMATOES IN POTS.

Active growth and the production of roots entail regular attention in training, rubbing out side shoots, and, after fruit is set and swelling, top-dressing with rich material. Water must be supplied as often as the requirements of the plants demand. A constant supply of air is necessary.

ACETYLENE GAS LIGHT FOR FORCING PLANTS.

A series of experiments made by the New Hampshire (U.S.A.) Station in 1902 proved that no injurious results were observed on the plants, and that the lettuce crops were more erect and weighed more. The question of cost shows that it can hardly be used with economy for forcing, but that for lighting greenhouses it is cheap and easily piped and run.

POTATO CROPS.

"Pater" accuses me of poking fun when asking for the number of cut sets producing that 1,082 lb. crop. I am sorry they cannot be found; perhaps they have decayed. However, he has furnished reported particulars, dropping 410 into 672 lb. from 1 lb. of seed. One hundred and twenty-one cut sets is getting desperately near the object of which I was afraid; eight deep eyes to 1 oz. must be terrible. In the first 1873 American trials, there were whole eyes and sections of eyes, so as to give fifty to a hundred sets to the lb. Perhaps "Pater" can define these half-eye openers.

Taking these to be the actual facts, does it not resolve itself into more of chance purchase than of culture? The competitor buying least tubers would gain upon another having tubers larger in diameter. I am glad "Pater" is going to describe the manures used in producing what he terms the biggest crop exhibited in England from 1 lb. of seed, as an abstract. The actual result may yet prove to barely reach 5½ lb., or a dozen tons per acre.

With such exceptional cultivation, it practically proves the value of ordinary 2 oz. or 3 oz. sets, full of farina, gluten, and sugar, the only true and proper nourishment for the young infant buds to feed and strengthen themselves upon prior to and when roots begin working in the soil.

The 65 lb. quoted by me was the actual average struck between 130 lb. product from 2 lb. of seed planted. A second cultivator had 111 lb. from 2 lb., and a third 15 cwt. from 1½ stone, manv of the roots averaging 12 to over 14 lb. each on fairly rich but unmanured land; nearly fifty of the sets were planted whole.

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Answers to Correspondents

"Nogers."—The sample of poisonous plant sent for identification was too far gone. Send a complete plant in flower. The nearest we can get to your specimen is Lotus corniculatus, but with no certainty.

"House."—Begonia culture is not difficult. The soil should be sound loam, leaf mould and sand in about equal proportions. Makes perfect drainage with shards of broken glass. When sowing the seed make the surface smooth, and immerse the pot in water for half an hour. Sow thinly and cover with a mere dusting of sand. Spring is the time for sowing.

"Rust."—Rust in Carnations should be treated with sulphur.

"Wilfrid."—Canna seeds should be sown next month.

"La Belle."—Tulips will grow anywhere with plenty of shade and water.

"Chrysanthemum."—It is usual to tie the plant to stakes. If this is adopted we should recommend iron stakes They can be hidden by the foliage and will last for years. A better method is to run two wires along the length of the bed. The plants can then be tied up in any fashion desired.

"Show."—Liquid cow manure is the most serviceable for chrysanthemums, used with care not to overfeed. When the buds open and during flowering no manure should be given.

"Codlin."—We have no hesitation in saying that the codlin moth grubs can be killed with a spray of Kedzie's arsenite of soda. The spray should be kept on the fruit from the first falling of the flower petals.

"Orchardist."—Have you tried sulphate of iron as a spray for black spot? We have not heard of it being used, but believe it would succeed if used before the leaves come.

"Plumes."—The secret of obtaining fine plumes of Pampas grass is a plentiful supply of water. The botanical name is Gynerium Argenteum.

ROSE W. A. RICHARDSON.

The popularity of this Rose was ensured from the time of its first appearance at the shows, now many years back, when Rose lovers were astonished and charmed with its richly colored flowers. Now it is much grown, and, still remaining without a rival in its unique color has also proved one of the very best Roses for walls, fences, arches, or any situation suited to a Rose of vigorous climbing growth, whilst it is second to none in profuse and continuous blooming. Some years back complaints were made of its erratic behaviour. Of two plants growing several yards apart, apparently under exactly the same conditions, one refused to grow at all, but just lived, whilst the other covered the entire space allotted to the two plants, and now annually hides the wall and its own leaves in a marvellous profusion of flowers. The first display is always a great one, but it does not exhaust the energies of the plant, as after a short rest it commences flowering again and blooms throughout the autumn. The flowers are also disposed to vary in color, the blooms of some plants having their outer petals almost white, and only the rich apricot tint in the centre. These are disappointing, but, happily, they can be avoided, also the inexplicable failure of plants to grow. W. A. Richardson grows and flowers as well upon its own roots as on any stock; therefore propagation by cuttings from plants that bear the brightest and best flowers will give plants free from any defects of this sort. Plant own-root plants in light rich soil and they will soon show that they have abundant natural vigor, which is not increased, but often diminished, and the plant's life shortened by condemning it to grow on any other roots but its own. This Rose is quite as important as the best Dijon Teas, and surpasses these last in color effect and lavish profusion of flowers.

The Flower Garden

OPERATIONS FOR MARCH.

March is the month in which to prepare and plant bulbs. Many gardeners prefer bulbs to any other variety of flowers, largely owing to the fact that they are not so subject to the depredations of snails and slugs. There is much to be said in favor of this. Bulbs are not free from disappointments, but they are in no measure so liable to disappoint as are annuals and biennials. Few things are more disheartening than to find a nice little lot of seedlings eaten up at one night's debauch by slugs.

NARCISSUS "MADAME DE GRAAFE."

Daffodils

are the most popular bulbs and the most highly favored in the matter of special culture. To those who would plant Daffodils, we must advise that the choice of bulbs had better be left to practical growers. The nurseryman is generally the best practical guide. He will not only be pleased to sell the bulbs, but also to talk about them, and give instructions upon how to plant and cultivate. Their names are legion, but they are botanically divided into three groups, viz., Magni coronate (large crowns), Medii coronate (medium crowns), and Parvi coronate (small crowns). No gardener can go wrong in planting Daffodils. They are most adaptable plants to climate and soil, and will accept anything but too much manuring. A good many failures arise throught overfeeding. They are good anywhere in the beds or borders, and in pots, too. As cut flowers they are most satisfactory, blooming up to the last bud, the flowers keep well, and have a beautiful perfume. Now is the time to plant, and it will be well to give them a space to themselves, otherwise when they die off above the ground the bulbs are liable to interfere with after operations in the beds.

We have written a good deal about the Gladiolus, and are bound to say that it promises to rival the Daffodil in popularity. The chief reason being that Gladioli can be planted every month in the year, and thus maintain continuous blooming. In this respect it has a distinct advantage over its rival. The two flowers are so opposite in their form and colorings that comparison is out of the question. The beautiful points of delicacy and tinting of the Daffodil will never be superseded by the bold colorings, or even the tintings of the Gladiolus, but the latter has many points in its favor. Specialists are producing such a tremendous variety and range of coloring in the Gladiolus that it is bound to become popular. In cutting for decorative purposes it is almost without a rival in effectiveness, where bold designs are required. They can be planted this month.

Hyacinths still retain a strong favor amongst growers who know them, but in popularity they have been outrivalled. It must be remembered when planting that they are deep rooted, gross feeders, and will take plenty of water. They require to be taken up after the tops have died out.

Other bulbs that will all repay planting are Amaryllids, Irises, Liliums, Tulips, Ranunculi, Anemones, Snowflakes, Babianas, Iscias, Tritonias, Scillas, Agapanthus, Alliums, and Watsonias. How deep to plant bulbs is a question always asked by the amateur. No hard and fast rule can be laid down, but if we say three times the depth of the bulb the planter will not go far wrong.

Hardy Annuals

can be sown this month for early spring, and amongst the seeds for choice we can name French and Shirley, Poppies, Lupins, Phlox, Lobelia, Nemophila, Stocks, Delphinium, Cornflowers, Coreopsis, Candytuft, and Gaillardia. Sweet Peas are great favorites with the Americans, and should be be more highly favored with us. Sown in the autumn, they grow stronger than the spring sowing. A succession of planting will keep the flowers blooming for a long period.

Herbaceous plants can be propagated, and cuttings taken from Petunias, Fuchsias, and Verbenas. Violets, Primroses, and Polyanthuses can be taken up and divided.

The fork should be kept going in remaking beds, plants tied up, seed pods gathered, and withered blooms cut off. In fact, during March month a good deal of tidying up generally will keep the gardener well employed.

CHRYSANTHEMUMS.

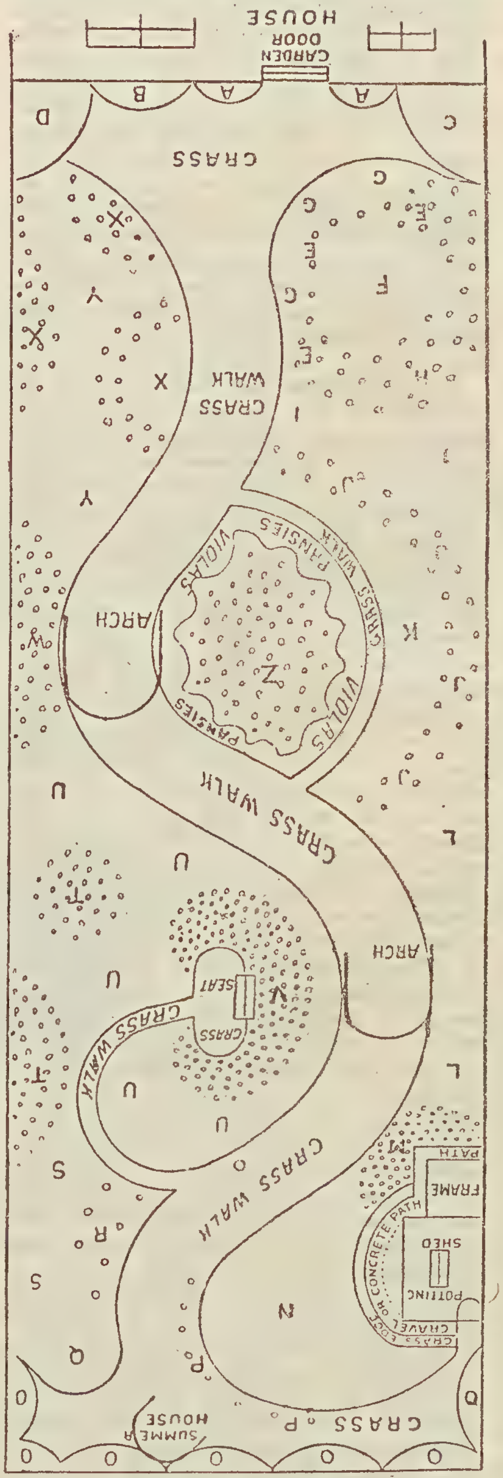
CULTURAL NOTES.

Now that the plants are all in the pots in which they are to flower, except perhaps the latest batch that are to give us the last crop of flowers, provision must be made for getting them into their summer quarters without delay. Usually at potting time they are stood close together in a sheltered corner until all are potted. By that time the forwardest will have become nicely established in the large pots, and will be ready to undergo the usual routine of summer management. Where several hundred plants are cultivated for the production of large blooms and a large batch for cutting from in addition to a goodly number for providing late flowers, a large space must be provided for them during their summer season. The best site should be set apart for those plants that are to produce blooms for exhibition, as plants that are immature in growth cannot produce the finest flowers. If the growth of the plants has been gross during the summer, with large leaves and thick fleshy stems devoid of woody tissues, we know that the requirements of the plants have not been all that was necessary during the growing season. Too liberal use of manure in the potting soil and loose potting may have much to do with this state of things, but an unsuitable position for growth during the summer may have even more to do with the unsatisfactory condition plants are found in at the time stated. A position sheltered from the south-west and in the full blaze of the midday sun, and as long as it can be obtained during other parts of the day, is the best that can be chosen for the plants. Here with plenty of space the growth matures as it proceeds. The best position of all is beside paths near to the water supply, where abundance of light is assured and the plants standing on boards, slates, or tiles are convenient for attention and handy to water. Provision must be made to secure the tall-growing varieties against breakage. For those that grow 10 ft. high or more. two wires fixed to stout posts, if the line is a long one, will be required. To these wires the stakes in the pots should be made fast. Some cultivators tie the three branches loosely to one stake thrust into the pot. It is a much better plan, however, to tie the centre branch of the three to this stake and make the remaining two fast to temporary small stakes tied to the wires. In this way all the shoots or branches are spread evenly out and given an equal amount of space, so that the leaves of one shoot do not overlie those of its neighbor. By this means the development of the leaves will be perfect and will not be nearly so liable to attacks of mildew as they are when huddled together. Where the plants are of necessity placed in parallel rows in one block, they must be so arranged that the shade thrown from one plant does not affect the next plant. Where possible under such conditions the rows should run east and west and be at least 5 ft. apart. The plants should be restricted rigidly to the number of shoots allowed, which usually is three. A few cultivators confine many of their plants to one stem only. I think, however, that this is a waste of time. A well-managed plant will produce three blooms as good as one. A single-stemmed plant allows no margin whatever for injury. All side shoots ought to be removed as fast as they appear. It is a useless waste of energy to allow these surplus growths to remain until they are several inches long and then remove them. The present bright and warm weather is having its influence upon well managed plants, which are making rapid and satisfactory progress. Continue to supply them with water at the roots as required. Newly potted plants do not require the same quantity as those that have become well established. Any plants that exhibit a tendency to paleness in foliage directly after potting ought to be kept rather dry at the roots for a time. Syringe the foliage twice daily.—E. MOLYNEUX.

PRETTY GARDENS

I was greatly interested not long ago in seeing a charming flower garden that occupied only a long narrow strip of ground. In all but one instance the paths were of turf—the exception to the rule being a narrow walk of concrete enabling the gardener to get all round the potting shed and frame. The wide grass walk down the garden gave it a delightful eye-restful effect, and showed up the beauty of the shrubs and flowers far better than gravel; it was merely a portion of the original field improved by cultivation, and, owing to its simply rounded outlines, was probably little trouble to keep cut and trimmed. At the mouth of this walk a widening took place into a small lawn that came right up to the garden door of the house, and to some round beds beneath the windows.

Of these beds, those marked A were of Narcissi and dwarf Tea Roses: B, of Hyacinths, Pinks, and Hybrid Perpetual Roses; C, of Rambler and Polyantha Roses; D, of Ampelopsis Veitchii up the walls, Foxgloves, Honesty, Solomon's Seal, Vincas, Pansies, and Primroses, with ferns in front. The other walls—those of the house—were Clematis covered.



A Plan of A Pretty Garden.

The left hand border bed where E's are marked, contained more Roses, with Delphiniums, Oriental Poppies, and Chrysanthemum maximum and other white Daisy-like Chrysanthemums at F; Violas at G; and the sheltering group of shrubs H were merely Laurels, Aucubas, and others. It is seldom that Laurels are made so serviceable as in this case, where they formed a screen from the cold winds.

The ground I, between the Laurels and a semicircle of double and single Hollyhocks; J was given up to varieties of Sunflowers; tall perennial Helianthuses occupied positions against the red brick wall, dwarfer varieties, double and single, came next to these, room being left for the addition of annuals; then small specimens, including those good for cutting, came down to the very edge of the grass.

At K Aquilegias, Wallflowers, Tulips, Iceland Poppies, Montbretias, and a Carnation collection kept the ground gay during the spring and summer months I was told, and the Viola edge was continued next the grass. At L Roses, an ancient Gloire de Dijon especially, rambled up the walls, and Dahlias, early Chrysanthemums, and Narcissi occupied the rest of the space. A group of Rhododendrons at M hid the frame and the path round it, without obstructing the light and air too much; N was a real herbaceous bed, made up of all the useful perennials, both tall and dwarf. The beds O round the end lawn were gay with Geraniums of different sorts, and Tulips and Hyacinths had been in them earlier. Eight standard crimson Roses, L, at the edge of the grass, gave the occupants of the summer-house something pleasant to look at.

At Q early Chrysanthemums, Phloxes, Myosotises, and Spanish and German Irises were mingled; a group of mauve and white Lilacs was at R; while Delphiniums rose up at S, among a good assortment of Michaelmas Daises, tall and dwarf, which were, of course, not flowering, when the perennial Larkspurs were out.

T's show two other clumps of Rhododendrons, and where U's appear bedding plants were employed to keep the scene beautiful, following spring bulbs; at V the humble Laurel again proved its efficacy as an attractive living screen, sheltering the seat upon a grass plot. This seat, it should be noticed, faced full sunshine, whereas the summer-house looked towards a colder quarter; thus resting places were provided for both winter and summer use.

W distinguishes a shrubbery composed of Syringa, Hawthorns, a Cistus, Viburnum, American Currant, Darwin's Berberis, Symphoricarpus, Golden Broom, White Broom, Golden Elder, Laurustinus, and some Hollies. X, against the wall, shows the positions of Rambler Roses, with a few of the good old-fashioned Provence, Cabbage, Moss, and China Roses made a charming show, encircled, Y, by low-growing perennials in great variety.

It remains only to state that the chief rosery at Z had numbers of Liliums also in it, and a waved border of Pansies and Violas; while one arch was covered by Clematis Jackmanii and Winter Jasmine, the other by White Jasmine and a Crimson Rambler.—M. HAWTHORNE.

A LOVELY NEW FLOWER (GERBERA JAMESONI).

By S. Mottet, Révue Horticole.
January 16th, 1903.

The Révue Horticole has more than once drawn the attention of readers to this beautiful composite plant, brought from the Transvaal, all too rarely grown, and one to which the regretted M. Micheli quite lately, in the same paper, gave the highest praise.

The eagerness of amateurs to possess and propagate this plant is the more easily understood since so few of the composite flowers have the same highly decorative qualities.

The decorative points of the flower are, its extraordinary size and beauty, its richness of coloring, the length and stiffness of the flower stems, the lasting power of the blossoms, and its perpetual flowering through the whole season We cannot, however, say the same of the foliage, unhappily insignificant, recalling the common dandelion.

Although counting barely 20 species, the genus Gerbera, of the sub-class Mutisiaceæ, has not yet attracted much attention from growers, only a few species having been introduced, and these of purely botanical interest. Such are G. Anandria and G. Kunzeana, low-growing plants of no decorative value. G. Asplenifolia (Sprenger) is certainly more interesting, it is said to be a beautiful plant with lilac flowers, but it is doubtful whether it is still cultivated. As to G. Viridifolia, only introduced in 1896, which is said to have flowers, white inside, yellow outside, no more has been heard. G. Jamesoni must then be considered the pearl of the genus. It was found in 1888 in the gold-bearing Barberton country by Mr. R. Jameson, and named after him by Bolus. It has since been found in several places in Natal and the Transvaal, showing more or less definite variations of form and color; some of these have been introduced and will be mentioned later. English people, with their fancy for popular names, have already baptised it with names recalling both its origin and the resemblance of its flowers to a large Marguerite. So we find it called the Transvaal or Barberton Daisy.

Although cultivated since 1889, this plant has spread slowly, owing to difficulties of growth and propagation. In France, at any rate, it is still only in the hands of some devoted amateurs and a very few growers.

Gerbera Jamesoni is described as follows:—(Bolus) Plants perennial, cespitatius, acaulescent, softly downy. Leaves erect, numbering 5 to 7, arranged in a rosette, reaching 12 in. to 16 in. in length, and 2½ in, to 4 in. in their greatest width. Petioles exstipulate, rounded, violaceous snd sprinkled with long hairs. Leaf thick, coriaceous, lanceolate, irregularly runcinate pinnatifid, with sharply toothed lobes, the terminal wider and obscurely dentated, the lower decurrent in narrow wings along the petiole; the upper face covered with short coarse hairs, which give it a greyish-green appearance; the lower surface softly downy with prominent and reticulated nervation. Peduncles radical, rounded, naked, erect, rigid, sometimes 20 in. to 30 in. in height, covered with soft hairs, greyish in color and bearing a single large terminal flower-head, formed of an involucre of a single row of long lanceolate bracts, very sharp and covered with woolly hairs. Florets of the circumference ligulate, in a single row, radiating, numbering about 30 to 40, very long and narrow, 2 in. in length, thus giving the expanded flower-head a diameter of 4 in. to 5 in.; only one-eighth in. wide, lanceolate, sharp and undivided at the end, of a beautiful scarlet-orange color, lasting almost a fortnight, closing up at night or in dark weather. Florets of the disc numerous, also orange colored, tubular, surrounded with a strong tuft of numerous hairs, as long as they are themselves, reddish and scabrous. Seeds spindle-shaped, narrowed at the extremities, about half inch long, strongly ribbed, scabrous and reddish. The plant blossoms continuously from July to October, each plant producing 5 to 10 flowers Habitat South Africa. Introduced in 1889.

The uncommon size and color of G. Jamesoni are not its only claims to be a decorative plant. We may add the stiffness and length of the flower-stalks, which have been seen 3 ft. high, and above all the lasting qualities of the bloom, so unusual in a composite flower. M. Micheli says the flowers last more than a week, but we ourselves have seen them, under glass and in full sunshine, last almost a fortnight. Every evening the ligules become vertical, only to open horizontally again next morning, and, during the day, says M. Micheli, the flower-stalk turns so as always to face the sun; it is thus essentially a sun-loving plant, a fact to be remembered when choosing a situation for planting. Although not as yet widely dispersed, there are already several varieties of G. Jamesoni, which should be known. First, G. Jamesoni Sir Michael, with chrome-yellow flowers, grown and described by Mr. Irwin Lynch from seeds gathered by Mr. Adlam at Pietermaritzburg; then G. Jamesoni Atrosanguinea, blood-red flowers (Sprenger), G. Transvaalensis (species or variety) owned by a Belgian amateur, the variety Illustris, described by an Italian journal as the strongest plant of all, with flowers both larger and more brightly colored; finally, a hybrid, or more correctly speaking, a cross, recently got by Mr. Lynch from the beauti- Sir Michael crossed with the ordinary type, and named Brilliant, the flower being vermillion red, of great size, with large ligules and wide and abundant foliage.

The cultivation and propagation of G. Jamesoni have been the principal obstacles in the way of its diffusion, for, although we cannot call it delicate, nevertheless it will not stand the treatment usually given to perennial plants, not being hardy enough for this, besides being a slow grower.

In practice it is propagated from seed, which often fails, the flower-heads either aborting entirely or only giving a very small number of fertile seeds, even when artificially fertilised.

The hairy nature of the stem, and the long taproot which grows slowly, makes us chary of risking division, unless the plant is very strong and well-established, and, after all, from a decorative point of view, it is undesirable to split your plant. In the north of France G. Jamesoni is not hardy, but a simple cool frame or bell-glass surrounded with straw, so as to protect it from frost, will be quite enough if the soil is healthy, a condition quite as important as the situation, which should be sheltered and sunny. Sandy peat soil, pure or mixed with leaf-mould and sand, appears to suit it best. Given these conditions, we have not found it necessary to take up the plants in autumn to shelter in hot beds, as M. Micheli recommends. To be quite safe, it is, of course possible to grow the plants permanently in deep, well-drained pots, where they do well. On the Mediterranean slope, above all near Nice, G. Jamesoni is hardy enough to be grown in the open, as is done in Italy. Undoubtedly it is in the latter country that the best results will be obtained from it, grown both for garden ornament and cut flowers. As to propagation, for the present we are reduced to growing from seed. Seeds sown in March or April, in moderate heat, show in a fortnight, the plants are then pricked out into seed pans in pure peat, and kept on a spent bed all summer, being repotted when necessary into larger sizes. In autumn they form young plants with about six leaves, which they keep till late in the season.

In spite of every care during later growth, these plants scarcely ever bloom till the third year; there is some compensation in the fact that the plants live to a good age. To sum up, G. Jamesoni is certainly worthy of the attention of amateurs, for the beauty and lasting quality of its its flowers. Florists also will need the flowers for designs and bouquets, even if the price is high. R.

ROSA INDICA.

Perhaps one of the choicest of the wild Roses grown in gardens is this species, and it is one that many would cherish if only for the fact that it is one of the parents of the loveliest race of Roses, the Teas. But it appeals to us through its beauty, and a little bed of it at Kew is gay with many flowers, which are of a bright self-crimson and borne in clusters. It is one of the few species that bloom continuously, and although not so robust as most of its kindred, merits a favorable position and amply repays any extra care bestowed upon it.

JAPAN ANEMONE, LADY ARDILAUN

Individually, the plants are much finer than the type, being more compact and flowering more freely. The extra stiffness of the peduncles is a point in its favor. The leaves are sturdy and have a glossy look about them which is pleasing. I think this Anemone will oust the older form when it becomes better known. Growing as I saw it in such hungry looking soil, and especially during the recent hot and dry weather that it has had to contend with, is really a thorough test of its non-liability to disease. The variety Whirlwind, growing alongside as I saw it, I look upon purely as a monstrosity, a good flower spoilt by the intermixing of the petals and green calyx-like substance that the flower is composed of.—E. M.

ROSES AT THE NATIONAL ROSE SOCIETY.

Mr. Edward Mawley, the very able secretary of the National Rose Society, has published his annual analysis of the Roses exhibited at the Metropolitan Show.

Since 1886 (he writes) the name of every Rose in all the prize stands at the Metropolitan Exhibition of the National Rose Society has been taken down, and the result afterwards tabulated. The average number of blooms thus dealt with annually has been about 1,800. In the complete table for the whole eighteen years can be found the number of times any variety was staged at all or any of these eighteen exhibitions.

There are some interesting points to be noted in Mr. Mawley's table. One is the rapid rise in popularity of the Hybrid Teas over the Hybrid Perpetuals. Five years ago there were only nine Hybrid Teas on the analysis for both of these classes, while there are now double that number in a list of sixty-eight, and out of the first ten they are as six to four.

BESSIE BROWN.

New Introductions.—Another interesting point is the popularity of new, and comparatively new, roses. The first exhibition of the National Rose Society was held in the year 1858, and, of all the prize roses in this year's show, only one was in existence at that date, General Jacqueminot, which had made its appearance only five years before. So that, of all the favorites of today, the oldest is just 50 years old. This table of Mr. Mawley's brings home to one irresistibly the fact of how modern a flower the rose, as we know and grow it now, is, in spite of its centuries of ancestry. For it is not only that the oldest Rose to gain a prize last July has but attained middle age, but the greater part of to-day's favorites are not yet out of their teens. The Rose most shown in 1902 and 1903 was Bessie Brown, a hybrid tea, introduced only four years ago. Mrs. John Laing, which took second place, has reached the mature age of sixteen, but, out of the first twenty, only two were introduced in the prolific sixties, and two in the seventies, while five came in the eighties, nine in the nineties, and two in 1900 and 1901 respectively.

Hesternæ Rosæ.—Now if an analysis could be made of the Roses most grown to-day in gardens, as well as of those which make their way to the exhibition table, it would almost certainly be found that the results, from the point of view of the extreme youth of the favorites, would be still more striking. If the growing of Roses for exhibition dates back less than fifty years, the growing of these for what has come to be called garden "decoration" is very much more recent still. It is so short a time ago since 99 gardens out of 100 which contained Roses at all had them on standards set in little round beds cut out of a lawn, that probably in nine out of ten that system is still the only one to be followed. The words of the wise old dean, the patron saint of English rose-growers and rose exhibitions, would have seemed extravagant to our fathers:—"There should be beds of roses, banks of roses, bowers of roses, hedges of roses, edgings of roses, pillars of roses, arches of roses, fountains of roses, baskets of roses, vistas and alleys of the rose." Yet these ideals are fast gaining ground. To-day for every one of the difficult show roses, "best in maiden plant," there must be ordered from the growers hundreds of Crimson Ramblers, Penzance Briers, and other varieties useless for the exhibition table.

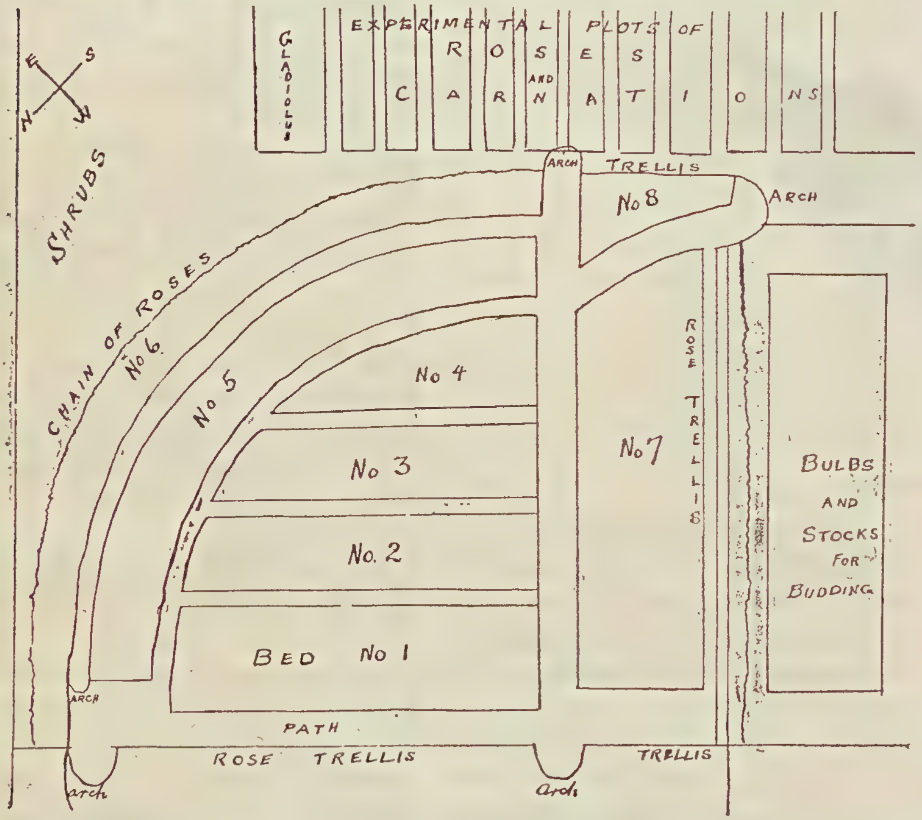
Accusations.—This rise of a new ideal of rose growing has led to a curious controversy, in which neither side seems to be right and neither wrong. In recent writings Mr. Foster Melliar, author of "The Book of the Rose," holds a brief for the one side, and Mr. William Robinson, author of "English Flower Garden," for the other. The opposing views are neatly put by Mr. Melliar. Is it to be the rose for the garden, or the garden for the rose? He, at least, has no doubt about it. He does not even think the rose "pre-eminent as a decorative plant," and he writes: "So, with all the best roses, I should not wish for or expect any general display at a distance, but come close and be content if I can find but one perfect bloom." And, as a consequence, Mr. Foster Melliar's labors amongst his roses all converge to the exhilarating moment when he sees his flowers staged on the show bench. Mr. Robinson has no doubt about it either:—Shows (he writes) have had a bad effect on the rose in the rose in the garden, where it is many times more important than as a show flower. The whole aim of the man who shows roses, and who is too often followed as a leader, was to get a certain number of large flowers grown on the dog rose, Manetti, or any stock which enabled him to get this at the least cost; so, if we go to any rose-growing friend, we shall probably find his plants for show grown in the kitchen garden with a deep bed of manure on the surface of the beds, and as pretty as so many broomsticks

And a Retort.—Mr. Foster Melliar retorts rather plaintively that experts are generally credited with some knowledge of their subject, and in fact begs the question, which is not whether the rose expert knows "as much about the things necessary for the welfare of those plants as other people," but whether he is necessarily the best judge of the "decorative" use of the roses. I think it is obvious that he is not, and cannot be, from the very fact that his ideal is not that of the garden made lovely by the rose, but the single bloom grown to perfection by whatever means are best suited to that end. But, after all, why should either enthusiast blame the other? Let each recognise that his opponent has a worthy end in view, although it is not his own, and the controversy melts into thin air.—The Bystander.

New Roses were sufficiently numerous at the meeting of the Royal Horticultural Society to constitute a feature of considerable interest to the large number of amateur and professional rosarians who were present. Messrs. William Paul and Son contributed their exquisitely beautiful hybrid tea Tennyson, which is unquestionably a most valuable addition to the section, and Pink Roamer, a Wichurian hybrid, robust in growth and exceedingly free in flowering, the blooms of medium size, deep rose, with white centre. Messrs. Paul and Son submitted blooms of their new hybrid Bourbon J. B. M. Camm, a strong growing and extremely beautiful variety that can hardly fail to take a prominent position in its section, and Anemone, a charming single variety, descended from Rosa sinica, with finely-formed single flowers about four inches in diameter, and of a lovely pink hue.

Arches of Roses.—Nowhere do Roses receive more appreciation than when clambering over some archway in a country garden, smothering the framework with shoots and rich clusters of flowers. The introduction of galvanised iron arches in gardens has done much towards encouraging a more general cultivation of creeping and climbing plants, but all Roses do not take kindly to such structures—at least in their bare condition. I have found, however, that a couple of coats of paint applied to the frame counteract the effect of extreme heat, but better still is the arch made of wood, however roughly formed. The Crimson Rambler has many admirers, and whilst one cannot ignore its quick growing and free blooming qualities, it is just as well to bear in mind this season when planting may be done some other sorts equally as useful. A few will be found in William Allen Richardson, nankeen yellow; Longworth Rambler, light crimson; Aimée Vibert, white, Waltham Climber, crimson scarlet; Alister Stella Gray, pale yellow; and Euphrosyne, carmine.—*Linderslea.*

DR. E. LESLIE POOLER'S GARDEN, MOUNT LOFTY.



Our ground plan shows the part of the garden now left to be described. Readers will notice on the lefthand side of the plan the main road coming from Mount Barker to Adelaide, and we have to apologise for our draughtsman finding it necessary to indicate by means of an arrow the direction in which Mount Barker lies. The Rose trellis, with two archways at the foot of the plan, is where we left our readers in the walk around the garden. This trellis, we may again remark, divides the rosary from the garden plots next the house, and very beautiful it looks when covered with its multitude of blooms of varying colors.

Passing under the archway on the left we were attracted first by

Bed No. 1.

Not that there is anything very beautiful in it from an artistic point of view, but to the seeker after knowledge there is much to be learnt. Here we get a lesson upon how the doctor does his budding, for the stocks are showing the first signs of the "working" of varieties on to them. They are all growing, hardly a failure to be found, and this, together with the careful way in which the work has been done, prompts our representative to ask the doctor to show him the secret of so successful a method. Nothing loth, the doctor points out in the first place that the stocks are all stout and strong, being good vigorous parents to carry the young offspring. Taking out his budding knife, the next thing to be observed is to cut the bud from a shoot which is likewise strong and vigorous, and he immediately cuts a piece of a strong shoot carrying a bud. He now holds the shoot with each end cut to make a piece of wood about 3 in. long, and about the thickness of a lead pencil. Now, he says, going by the book I should cut under the bud about an inch along the top of the wood. "But," he continues, "I don't always go by the books. You see, I split the wood down the centre and make an incision across the bark about half an inch above and below the bud. I take the pointed handle of the knife and ease off the bud with the bark from the wood. In that operation I do not in any way injure either the bud or the bark, which is really the secret of success. I now go back to the book and make the usual T incision in the stock, slip my bud into it, and tie it up, so. Nothing can be more simple and effective." This practical demonstration took about two or three minutes, and the growing buds in the incipient stages were ample proof that, book or no book, here was success. The success, too, was not only demonstrated in the beginning of the process, but in the lovely blooms all around on the well-grown bushes.

Bed No. 2

contains a number of the old favorites to be found in most gardens where Roses are grown. It was bordered with Primulas of all good selection, looking very attractive in their vari-colored blooming. Stocks were alongside of them to flower when the Primulas had shed their beauty. These stocks were all of one variety, pale blue in color.

Bed No. 3.

Here the centre of attraction is a tripod of Frau Karl Druschki, which Rose is a great favorite in the garden, and others of worthy notice are Mavourneen and Mamie.

Bed No. 4

has Margaret Dickson in the pride of place. This is a large white bloomer, distinguished by being named after the wife of the great rosarian, whose name it bears. Others of note are Vicomtesse Folkestone, General Jacqueminot, and Dr. Grill, each of them carrying honors in the home of Roses. A little mildew was noticeable on one of the plants, and the cure for this pest was readily given, consisting of ½ oz. of potassium sulphide to a gallon of water for spraying. The odor of this spray is not quite so sweet to the olfactory nerves of some people as that of Roses; but that is of minor importance if it takes away the mildew. The rosarian must not stick at trifles if he would be successful.

Bed No. 5.

This bed carries eleven standards holding sentry down the middle, while at the side are dwarf varieties on their own roots. Climbing Kaiserin Augusta Victoria completes the trellis to the archway. There are some choice Roses here, and we must name Jubilee, which is spoken of as the biggest bloomer, the best doer, and the darkest color of the hybrid perpetuals. Keeping company are Madame Lombard, Marquise Litta, Mrs. Edward Mawley, Billiard et Barre, Killarney, Marjorie, A. K. Williams, and pink Maman Cochet. All these Roses should have a place made for them in every garden.

Bed No. 6.

Dickson's Daisy claims first notice, and the Duchess of Portland, Admiral Dewey, an American selection, named after the famous gentleman of the navy, are doing well. A favorite white in Amateur Teyssier, and the buff-colored one is Madame Ravalry. Other selections are equally good as a matter of choice.

The chain of Roses dividing No. 6 bed from the little shrubbery is White Alister Stella Gray, Climbing Kaiserin Augusta Victoria, Cloth of Gold, Reine Olga, climbing Mrs. W. J. Grant, and Climbing Meteor. This selection gives a variety of color, and could hardly be improved upon.

THE SHRUBBERY

is planted with a variety of Ericas, and amongst the prominent things is seen Romneya Coulteri, which some gardeners will not cultivate because of its spreading habit, but which is nevertheless a most handsome and showy bloomer. Weigela, Spirea grand., Kerria Japonica fl. pl., Mock Orange (Philadelphus coronaria), blue Lilac (syringa), and the lovely autumn tinted though poisonous hus succedanea.

BED NO. 7

is found on the other side of the ground plan, and contains a fine collection of Roses, which will all bear description, but a few can only be named for the benefit of those who would have the best of the queen's beauties in their gardens. Kaiserin Augusta Victoria, Duke of Wellington, Ellen Willmott, Catherine Mermet, Sultan of Zanzibar, Crown Prince, Souv. de Pierre Notting, Madame Hoste, Lady Roberts, Hon. Edith Gifford, and a prize-winner at home named Innocente Pirola, which is a good doer, and the doctor would like to know why he does not get any good blooms from it.

BED OF BULBS AND STOCKS FOR BUDDING. This bed looks happy and bright when the Daffodils are at their best, but the nursery appearance of the bed is hidden from general view by a trellis of Roses. Amongst them is a Crimson Rambler, five years old. Some idea of the beauty of this Rose may be gathered from the fact that during December the doctor sent a number of trusses to friends, and on one day cut off 765 withered trusses. Some of the trusses contained more than a hundred single blooms on each. There are also here Celine Forestier, Reine Marie Henriette, Rev. T. C. Cole, Fortune's Yellow or Beauty of Glazenwood, and Reine Olga. Leading from Bed No. 8, which is devoted to Carnations, the visitor passes under an arch of Cloth of Gold, which is the first of a pergola in the course of erection. Passing under the archway we enter the

EXPERIMENTAL PLOTS

of Gladioli, Roses, and Carnations. The Gladiolus bed on the left was a sight worth going a long way to see. At the time of my first visit the doctor pointed to a number of baby seedlings, a cross between some of Groff's and Triomphe de Paris, which were intended to blossom this year. Later on I saw them in bloom, and would suggest that they should be classed as Triomphe d'Aldgate, with varieties named after their colors or markings. Some of the blooms were the finest we had ever seen. After throwing out all the indifferent ones he retained about 135 plants there and about the same number in another part of the garden. This selection is made from all sources, with the utmost care to retain only those deemed worthy.

Next to the Gladioli is a series of thirteen plots 4 ft. wide with 2 ft. pathways between. These beds each contain one row of Roses and a row of Carnations on each side.

CARNATIONS

are another specialty with the doctor. His collections come from all the best sources of standard growers, and his own cross fertilization is deserving of the happiest results. In the collection are five beds of Chabaud giant perpetuals, being one bed each of Jeanne Dionis, Marie Chabaud, Enfants de Nicè à fleurs géantes, and Madame B. Chabaud and Etincelant. Next are three beds of the doctor's own seedlings, which are all picked crossings to the total of 172. The two top beds are devoted to named varieties, all looking well.

Main Rosery, showing chain in No. 6 bed on ground plan.

First Arch of the Pergola.

ROSES.

The experimental plots contain 150 different kinds, bringing the total in the garden up to 353. There are about 500 Roses altogether. The doctor is a believer in dwarf plants budded down as close to the ground as possible, and he intends to get all the standards out eventually. We make a selection of these 150 for naming, acknowledging that perhaps those not in our list are equal to those that are named. The purpose of naming the varieties is for a guide to our readers who may be making a selection. Suzanne Marie Rodocanachi, Pink Maman Cochet, Gloire de Margottin, Augustin Guinnoisseau, La France, Shandon, Queen of Queens, G. Nabonnand, Waban, Mad. Julez Grolez, Frau Karl Druschki, Mrs. W. J. Grant, Mrs. Rumsey, Souv. de President Carnot, Duchess of Albany, Marguerite Appert, Mrs. Cocker, Mad. Scipion Cochet, Earl of Dufferin, Ada Carmody, Col. Felix Breton, Marchioness of Dufferin, Gruss an Teplit, Golden Gate Princesse Alice de Monaco, George Prince, White Maman Cochet, Helen Keller, Helene Cambier, Ards Rover, Lady Clanmorris, Mad. de Watteville, John Hopper, Louis Van Houtte, Firebrand, Victor Verdier, Souv. de Pierre Notting, Lady Castlereagh, Duke of Edinburgh, Ferdinand Jamin, E. Y. Teas, Marchioness of Londonderry, President, Etienne Levet, Marchioness of Lorne, Pride of Waltham, Medea, Francois Michelon, Captain Hayward, Marie Guillot, Countess of Caledon, General Gallieni, and Marchioness of Downshire (the doctor's birthplace).

Rose Hedge.

A new division fence has to be covered, and the doctor entrusted this labor to white and yellow Banksias, Macartney, Anne of Geierstin, Mad. A. Carrier, Billiard et Barre, Julia Mainwairing, Austrian copper, Marie Van Houtte, Lord Penzance, Barou Job, Boule de Neige, Duchesse D'Auerstadt, Mons. Désir, Irish Beauty, Killarney, Mad. D'Arblay, Pink Rover, Irish Modesty, Amy Robsart, W. A. Richardson; and My Pet.

The Pergola.

In course of construction is a rose pergola or covered trellis, and it may interest some to know how this is to be covered. Five upright posts will carry the selection of Roses. No. 1, Cloth of Gold, Euphrosyne, and Ards Rover; No. 2, Acidalic, Psyche, and Souv. de Mdme. L'Viennot; No. 3, Souv. de Wooton, and Belle de Baltimore; No. 4, Reve d'Or, Rampant, and Amadis; No. 5, Aglaia, America, and Olivet.

This closes our description of Dr. Pooler's garden, not forgetting the other head gardener, Mrs. Pooler, and the assistant, Wilfred Ashenden, who appear to be all equally interested, and we feel it inadequate. Every plant of consequence in the garden is as carefully labelled as it would be in a nursery, and perhaps more so, and we congratulate the gardeners upon their successful hobby. We would like to take our readers inside the house and show them the researches and collections in the science of entomology. Here they would see as pretty a collection of moths as they could wish, besides many other things interesting to the naturalist. But we must take our leave.

IBERIS GIBRALTARICA.

This is perhaps the largest as well as the showiest member of the Candytuft family. The plant will frequently, when grown in warm well-drained soils and positions, survive an ordinary winter. Plants raised from seed sown, preferably in the open ground, as they do not transplant readily, will be strong, and should they survive the winter they will make a fine display the ensuing spring and early summer. On light sandy soils the plant is usually a success, and the large heads of delicate lilac flowers are very showy. It may be raised freely from seed. On this account it is not worth the trouble of increasing by cuttings, unless it be an exceptionally fine kind. In my experience of it, the cuttings are liable to canker instead of rooting in the usual way. By treating it as a biennial, sowing the seeds in the open or thinly in pots, a supply may easily be kept up. As a pot plant for the conservatory it is very useful, and the flowers lose much of the lilac hue that they assume out of doors. For this purpose when well grown the flowers are nearly pure white and very effective. Heat is the reverse of beneficial, and if applied the plant quickly becomes weak and useless.—E. J.

NOTES FROM A NEW ZEALAND GARDEN.

To admit that one may have too many Daffodils is to admit a great deal, and I will not be brought to the admission except it appear that my stock has reached that point when increase in quantity must be made at the expense of quality. But I have my fears. This year I have been replanting by the thousand, and my experience meanwhile has not been entirely satisfactory. Every Daffodil grower knows the pleasure of handling a fair-sized, well-ripened, and well-shaped bulb, brown, firm, and silky, like an onion. For my own part my pleasure in the bulb is little less than my enjoyment of the flower. But little of that pleasure have I had this year, though I have planted so extensively. In the case of some varieties, though the bulbs are fairly large and healthy, they have, from overcrowding, become laterally compressed in a way no grower of Daffodils can approve, whilst the outer skin has not the silky brown gloss that the epidermis of a perfect bulb ought to have. Empress has, I think, under any conditions of growth, an ugly bulb in contrast with the fine, large, smooth-skinned bulb of Emperor. I have more than once remarked the difficulty of distinguishing Empress from Horsfieldi, and I have pointed out in former notes that they are distinguishable by their relative seed-bearing qualities, Empress being almost or entirely sterile, and Horsfieldi fairly fertile. I notice also that they differ markedly in the shape of their bulbs, that of Horsfieldi being flatter and fatter of the two.

As to the multiplying of varieties, I am entirely convinced that the number is already too large; and each season I resolve to extend my list no further, but each season when the new catalogues come in my good resolutions go to the wall.

Writing of varieties, I am taken back across the years to a garden that knew no more than three varieties of Narcissus, and yet the Daffodil show of that old garden in the early days of April was not contemptible. It was a disgracefully utilitarian garden, and shockingly geometrical in design; a square of perhaps a couple of acres in extent. There was nothing about it that a modern æsthete would call picturesque, except perhaps its mortarless wall which so completely shut in that no glimpse of the inside was possible except through the pickets of the gate. The wall had originally been finished off with a thick coping of turf, and this in time had mellowed into loam, giving foothold to various kinds of waving grasses, to patches of the common, but beautiful yellow-spored Polypody and rosettes of Houseleek.

I find it hard to believe that there exists now anywhere on earth a place so rich in wild flowers as the country-side in which that garden lay. It was one of those sub-alpine regions where you stand on the border-land, as it were, between the loveliliness of the fertile lowlands and the stern loneliness of the granite hills. A walk of an hour or so would take you into a wilderness of heather, where in the peat-bogs you might find bog myrtle and cotton grass, sundews and butter-worts and Sphagnum moss of all shades, green, yellow, pink and crimson. In the near neighborhood of the garden the most common weeds were lovely flowers—wild thyme, darnel, brooklime, bird's-foot lotus, harebell, meadow-sweet, and so on. In the woods that lay around and by the mountain stream a stone throw from the gate you might walk ankle-deep in woodruff, wood anemone, and marsh marigold, knee-deep in wood hyacinths, thigh-deep in lady fern, and over the head in foxglove, bracken, and wild raspberry. A few minutes would take you to the shady home of the Trientalis europæa, lily of the valley, oak fern and beech fern, Crystopteris fragilis and Asplenium nigrum, A. viride and A. Trichomanes. Take a short walk in one direction and you might gather sheaves of bog iris; the same distance in another would bring you to the habitat of the fringed bog bean, rare of blossom. In autumn if you looked towards the hills they were purple with heather, if towards the woods they were scarlet with the mountain ash (locally, "rodding"). As for gorse and broom, dog roses and sweet brier, ivy, bird cherry and wild cherry they were abundant and glorious.

And yet in this richly-endowed district Nature had made strange omissions. Primroses there were in plenty, enough to make the air smell faint. But the cowslip, which decks the English meadows with delight, was wanting. No child in that locality ever tasted cowslip wine or threw a cowslip ball. Nor were there sweet violets beneath the hedges, though there were myriads of the scentless lilac kind, which we called the "Cuckoo Flower," because bird and blossom came at the same time; nor meadow saffron, nor snowdrops, though there was a wood not ten miles away where they were as grass; nor hart's-tongue fern, except in one hidden spot where those in the secret could get it by risking their necks, nor wild narcissus of any kind.

Our forest trees may not have been so remarkable as our wild flowers; and yet, on second thoughts, I think they were. The finest autumn display of fireworks was made by a slope of beeches that burned themselves away through a scale of brilliant color into the light leather-brown of their winter leaves; and the same slope was just as beautiful in spring, as may be conceived, for what is more exquisitely delicate than the young foliage of the beech? unless it be the young foliage of the oak, a green with a yellow in it, seen in nothing else that I remember, except the oak fern, whence I take it this last has its name. Then there was the "big beech," covering who knows what area, and giving shelter in its time to countless generations of children who played under its branches and fattened on its mast. The beech accumulates its hardwood but slowly, and this particular behemoth must have been centuries old. As for our oaks, there are no doubt older, larger, and mossier oaks elsewhere, but ours were old and large enough for me. Then there were hoary spruces, the abode and breeding place of squirrels, miles of larch, with its green and crimson tassels, sweetest of all the conifers, and each larch seemed to have its chaffinch; silver birches by every stream, hollies too heavily berried for the birds to make an impression, cathedrels of Scotch firs, coverts of hazel, ivy, the small-leaved wild kind everywhere; tangles of honeysuckle and occasional colonies of sloe or white thorn. Further, these woods provided that without which no wood is perfect—solitude. You might wander through them a summer's day and meet none of your own species, nothing but harmless *feræ naturæ,* a pair of cushat doves or so, an occasional roe or squirrel, a pair wood wrens or some small deer.

In this country lay the first Daffodil garden I knew—the appurtenance to an old, stone, ivy-covered farmhouse, roofed atop with lichened slates, under which stray swarms of bees found harborage; a utilitarian garden, where flower, fruit, and vegetable grew in beauty side by side, not that there were elaborate mathematical devices filled with the primary colors; curves there were none, the people who walked in that garden always taking the shortest distances between two points. Even the gardener who was put there to dress it and to keep it did his work in a toying, amateurish way, as if he were the garden's leisurely owner and no hired servant. The garden plan was simplicity itself—a broad grass walk forming a square whose sides were parallel with the wall, and two broader grass walks dividing the first square into four shorter; along the sides of the walks, flowers, gooseberry bushes and standard fruit trees; inside these, vegetables. The gooseberries, as I remember them, were the sweetest in the world, the apples the sourest. As for pears and plums they were a mockery, except for blossom, and that was splendid. The apples (many of them) were little better than crabs, but in blossom time they were as fine as the best golden pippins—finer indeed, for the blossom of the golden pippin, I understand, is a trifle pale, whereas these sour, old moss-covered apple trees were hidden every spring in blossom, exquisitely flushed with pink, and some varieties were sweet and mellow even in the fruits; the small yellow, cracked oslin, for instance, and the oval, brown-cheeked Jenny Sinclair. The cherries were famous—blossom and fruit, more particularly one large wild cherry tree, locally called by the French name *guigne,* which in spring, when it was a sheet of blossom, was the haunt of the cuckoo; and in autumn, when its branches were red with fruit, haunted by blackbirds and by other bipeds of a lighter color. The walnut trees on each side of the gate bore beautiful large nuts with nothing in them, but Bacon must have had their leaves in his mind when he said that "certainly virtue is like precious odors—most fragrant when they are incensed or crushed."

As for flowers they were not very numerous or very various, or particularly choice. They were of the robust kind that, once planted, can hold their own; and yet they were sweet enough. There were bunches of auriculas, black, snuff-brown, and yellow, which were seldom, if ever, transplanted; more particularly there were frequent bunches of an early auricula that came with the primrose—pale lilac, sweet-smelling, smooth-leaved and dustless. I believe it must have been the original alpine species, and I desire it now more than the finest green or grey edged. Cabbage roses were plentiful, feeble as to stem and foliage, but large and plethoric as to their flowers. "Cabbage" roses, indeed! There were also crimson damask Roses, long and filbert shaped in the bud, and semi-double in the exposed state; also streaked York and Lancaster; also a white full-petalled summer rose, which grew almost to a tree, sweetest of roses for fragrance—Resa alba, I suppose. There were purple delphiniums and blue veined Aconites—"Monks-hood," as we called it, or sometimes "priests' poison." There were balm of Gilead, Rose of Sharon, Lily of the Valley, and no doubt other things known to Solomon; hepatica and the blue navelwort; spiræas, gardeners' garters, the purple flower-de luce, and southernwood; on the summer house, ivy, travellers' joy, yellow corchorus, the larger bindweed, and flowering current, the double red (which, strange to say, bore berries) and the single white. The lilac trees seemed to grow out of the stone wall, but their trusses of flower showed that they did not want for a good root-run.

Seeing that I began with Daffodils, all this may seem, as the French would say, "apropos of boots," but, in the manner of a roundeau, I return to my original theme. Every year the garden had its "spring cleaning," so that by the 1st of April everything was spic and span—all dead matter removed, raspberry canes and gooseberry bushes severely trimmed, and the soil delved and raked. At this particular juncture the Daffodils availed themselves to come out in bunches innumerable, regularly marshalled like an army, and therefore somewhat formal in arrangement, but all the better suited to the style of the garden, which affected straight lines. With all my varieties of Daffodil and various styles of planting, I am afraid I have never produced any more telling effect than was seen every spring in that homely garden. Perhaps it is that bygone joys loom large through the mist of memory. Too well

> I know, where'er I go,
> That there hath passed away a glory from the earth.

But still I know also that the fairness of that garden was not altogether in the youth of the eyes that saw it. Yet it possessed only three varieties of Narcissus — a medium-sized Nonsuch Daffodil, Narcissus odorous, and a Narcissus poeticus, which came a few days later than the Daffodil—ornatus, I should think, from its earliness. Nor was there any transplanting or thinning for twenty years at least, except perhaps when bulbs were given away. In my garden no Nurcissus known to me would remain satisfied with this treatment. The bulbs would crowd and jostle each other, and ultimately the blooms would deteriorate. But that old garden had a light pebbly soil resting on a gravelly bottom; whereas my garden has a somewhat heavy loam resting on hard clay, and this may make the difference. However that may be, the multiplication of varieties is becoming a matter for serious consideration.

A. W.—"The Garden."

THE FRAGRANT PINK.

The sweet-smelling pink is now a prominent subject in the floral procession of the year. It is one of the hardiest of our hardy perennials, and though old plants sometimes suffer from the rigors of the winter, yet it posseeses a remarkable capacity for recovering itself, and plants to all appearance in extremis become clothed with foliage and laden with blossom. Many of the old florists of a past generation commenced thetr floricultural career by cultivating the pink. We have heard the veteran John Keynes (long since departed) tell how, when a lad, he, unknown by his father, pawned his watch to buy his first collection of pinks. The varieties which he purchased in this way would not now be grown as border flowers, so great has been the improvement made in the pink during the past half century. Some seventy-five or so years ago there were but few florists in the south, except Maddock, who was succeeded by Groom and Davy, of Chelsea; and plants of florists flowers were principally supplied from the north, where florists largely abounded, and where floricultural enterprise was most active; it is on record that one Thomas was the collector or buyer for the southern florists, by which he made an independency and retired. It is difficult at this point of time to say exactly where the first laced pink was produced, but it was probably one named Lady Stoverdale, which appeared about 130 years ago; up to that time we can imagine the pink was a flower with a dark centre, and petals quite white and free from any tint of color, answering to the black and white of latter-day florists, but now a very scarce type indeed. Nor can it be stated with certainty whether the purple or red lacing characterised the earliest productions showing the laced form. To Groom and Davy succeeded Looker, who raised many varieties, Young, Smith, Kirtland, Costar, and others, followed later by Dr. Maclean, Turner, Reynes, Bragg, Read, and others. At that time there were many pink shows held about the country and around London, one in particular at Twyford, Hants, where Young, a noted raiser and cultivator, resided. Thomas Hogg, of Paddington, appears to have been more of a grower than a raiser, but the appearance of his treatise on the Pink gave a great impetus to the cultivation and exhibition of this flower. The "Florist" for September, 1848, contains colored illustrations of two of the leading pinks of that day, and it is seen that the rounded edge to the petals had been secured and universally recognised as an indispensable feature of high-class quality. A somewhat sharp controversy waged for some years between the northern and southern florists as to the size and fullness of the flowers; the latter favored size combined with the rounded petal and perfect lacing; the northerners preferred a smaller number of petals, derisively terming the larger flowers favored by the growers in the south as "mops." This, like other controversies, died out in course of time, but it was somewhat acute while it lasted. The abolition of pink exhibitions, while it has reduced to a minimum the production of new varieties, has happily not driven the pinks out of cultivation. Some of these being of a stiff, erect habit of growth make excellent border plants. John Bull, Modesty, and Mrs. McCrorie deserve a special mention in this respect. A few years ago Mr. James Thurston, then of Cardiff, raised several new varieties of fine quality, but very few of them found their way into cultivation. They appeared at a time when the interest in the flower was decidedly on the wane. Border varieties of varied character are still much grown, and apart from their usefulness as decorative agents in the garden they possess a distinctly commercial value, in that they are much cultivated for bunching for market purposes.—*Gardeners' Magazine.*

The Orchard.

OPERATIONS FOR MARCH.

NOTES ON PACKAGES USED AND METHODS OF PACKING FRUITS FOR EXPORT.

By George Quinn, in the "Journal of Agriculture and Industry."

Next to being able to produce first-class fruits to meet the requirements of outside markets comes the question of safe transit. It is true, the temperature and storage conditions maintained during the journey may be said to hold the key to the position; but, granted that the treatment in these respects on the voyage is in keeping with our present knowledge respecting what has proved successful in the past, the next consideration is the adoption of suitable packages into which the carefully selected and graded fruits should be securely encased.

The case now known as the "Peacock" case—from the name of the gentleman who first suggested it—is fast becoming the recognised standard for the European as well as the interstate trade in apples. The case has outside measurements of 10 x 15 x 20 in., so that if necessary in stacking the cases they will cross pack exactly, thus rendering the bond in the pile as complete as that secured by the bricklayer in his wall-building. It is claimed that this results in economy of the shipping space, enabling two or three cases more to be stored in a measured ton than was possible with the older styles of cases. When made from Tasmanian hardwoods, battens ⅜ in. in thickness are used in the sides, top, and bottom, and the ends are cut from boards ¾ in. in thickness. With our softer imported pine woods, the ends need to be ¾ in. or ⅞ in. timber, and some of the side battens from ½ in. material.

Mr. James Lang, the well-known fruitgrower, of Harcourt, Victoria, has suggested a modification in the thickness of the timber used in the battens which form the sides. This has been adopted here with conspicuous success, and the refrigerating engineer of the Orestes declared the cases shipped in that boat, which were made on Mr. Lang's plan, to be the best he had met. The modification is simply that the sides—the 20-in. side—are each made of four battens, two of which are ½ in. thick and two ⅜ in. thick. In construction the battens ½ in. thick are nailed on the outer edges of each side, and those ⅜ in. thick are placed side by side between them. This has two advantages, for not only does it give stability to the cases, but when they are laid on their sides in the ship or stack the thick battens of the upper case always rest upon those of the case beneath it. The thin, or ⅜-in., battens then are opposite and parallel to each other, affording a ventilation space of a quarter of an inch between each tier of cases, which cannot be omitted by careless stacking or removed by the shifting of dunnage or by splintering off, as was so often the result when a lath was tacked to the end of each case. To secure the proper "tightening" of the contents, when nailing down it is desirable that the top of each of these cases should be made from one piece of board rather than of two battens. When made as described above the cubic contents of this case is a fraction over 2,331 in. As an Imperial bushel contains 2,218,192 cubic in., the buyer secures full measurement when he purchases the contents as a bushel of apples. The spaces between the battens on the sides should not exceed ½ in., otherwise there is danger of sufficient of the convex surface of the fruits being squeezed in between the sharp edges, and thus being seriously bruised or cut. Rats also insert their sharp noses between wider spaces, and I have seen pieces which a shilling would not conceal eaten out of row after row of fruits in cases stacked overnight in wharf sheds.

In the filling of the cases it should be needless to repeat that only evenly graded, sound apples, of well-proved varieties, which have wilted for a few hours after being picked, should be wrapped and packed for export. If possible, grades which will allow the apples to be placed in the cases on their flattest sides or shortest diameters should be selected. If, however, a few have to be turned edgeways to fit in securely, it is better to follow that plan than to insert smaller fruits or permit slack packings. Respecting the use of wood wool, it is only necessary to use enough to fill gaps into which fruits of even grade cannot be fitted, while a good pad on the bottom, before beginning to pack, and on the top, prior to nailing down the lid, is valuable. If the bottom and top layers have the crown or calyx ends facing outwards, the appearance of the contents is enhanced when the cases are opened for sale.

Case for the carriage of oranges to Europe: Its outside measurements are 9 x 13 x 28 in. The ends and partition are made of wood ¾ in. thick, and the sides of laths ⅜ in. thick, the top and bottom being each composed of a single board ⅜ in. in thickness. A small lath cleat, ¼ in. thick, was usually nailed across each end for ventilation purposes. This was the case formerly used in the apple export trade from this State.

In packing oranges, besides paying great care to the quality, soundness, grading, variety, &c., sent, much depends upon the proper wilting, or toughening of the skins before the final packing is performed. To attain this the fruits must be allowed to stand in a shed or shelter for several days after being cut from the trees, until considerable evaporation has taken place from the skins. The fruits are then wrapped separately in paper, and, after putting in a pad of wood wool they are packed in rows until the case is filled somewhat above the top. Another pad of wood wool is placed over the fruits, the lid adjusted, and the case rocked endways sharply to settle them down. When properly wilted, oranges may be packed very firmly. As with the apples, it should be possible to stand the lidless case on end when packed, without the contents rolling out.

The grape case is similar in size and shape, but the sides are each made of two boards instead of four battens. In the grape case no open space is left between the edges of these boards; in other words, the edges of the boards meet, so that no granulated cork may leak out.

The method of packing is simple. The case is opened on one of the flat or wider faces, as shown in our illustration. The inside is lined with white paper, fitted in the ordinary way. The grapes, which should have been cut a few hours before, and kept dry, are embedded in granulated cork. A good layer of the cork is placed in the bottom of the case, and a tier of bunches of grapes placed on it. More cork is then put in and shaken down closely, between the berries and stalks, until the grapes are covered, and so until the case is filled, say, to half an inch above the level of its sides. The papers are then adjusted and the lid nailed on, after "rocking" down the contents, as described before. It takes from 5 lb. to 6 lb. of granulated cork—say, 1/3 worth—to fill the above case, and great care must be taken not to put in too much fruit and too little cork. The whole of the contents should be firm enough to form a compact block of cork, in which the grapes are embedded quite out of sight. If this is not done the berries protrude through the cork, which settles down on the voyage, and there is much danger of rubbing and decay. Jarrah borings or shavings have been used successfully in place of cork in this work. The varieties of grapes which have been shipped successfully thus far are limited.

The White American grape, known by the local name of Daira, has proved the most consistently successful. A small red grape, called by Mr. Hardy "Red Daira," has also travelled well. The Doradilla, when not over-ripe, and when the berries are thinly distributed upon the bunches, has also carried and sold well. I believe it would pay growers to thin the berries of this variety when half-grown, if they intend to export it to Europe. Anyway, any damaged or bruised berries should be cut away prior to packing any of the sorts. The Waltham Cross, Belas Blanco, and Santa Paula varieties have also been sent with varying success by various shippers, but for the present the first three kinds named here may be depended on to carry more consistently.

The crate and trays used for packing peaches to interstate markets by the South Australian Fruit and egetable Company: The outside dimensions of the crate are: 25 x 15 x 12 in., and the trays it carries are 23 x 13 x $2\frac{1}{2}$. The crate is made of four laths 25 x 3 x $\frac{3}{8}$ in., which form the sides. The ends are composed of four pieces $14\frac{1}{8}$ x 3 x $\frac{3}{8}$ in. These are held together by a post in each corner, which is $1\frac{3}{8}$ in. square, by $11\frac{1}{4}$ in. long, with a square of $\frac{7}{8}$ in. cut out of the internal angle, into which the corners of the trays fit. The battens are nailed to the top and bottom ends of these corner posts, while a piece 15 x 3 x $\frac{3}{8}$ is nailed across each end of the frame at the bottom. The trays rest upon this when packed into the crate. The top is made of four pieces, 25 x 3 x $\frac{3}{8}$. The trays are framed of three pieces, $12\frac{5}{8}$ x $2\frac{3}{8}$ x $\frac{3}{8}$ thick, which comprise the two ends and the central partition. The bottom is made of four pieces, each $22\frac{1}{8}$ x 3 x $\frac{1}{8}$ thick, while the two side pieces are each $22\frac{7}{8}$ x $2\frac{1}{2}$ x $\frac{1}{8}$. Across each end on the outside of the bottom a cleat $12\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{8}$ is nailed, which prevents the bottom of the upper tray pressing upon the contents of the one beneath it, and gives each tray a depth of 3 in. Each tray will hold four dozen good, fair-sized peaches.

Each fruit is wrapped separately in tissue paper, and over each tray and in any vacant corners wood wool is used to secure firmness and elasticity to the contents. The weak point about this crate is that half of the exposed surfaces on sides and ends and nearly the whole of that of the bottom is composed of the thin wood, viz., the sides and ends of the trays. As far as the pressure from other crates is concerned, the strain should rest upon the thick outside framework of battens, but the contact of the foot of the workman would be fatal to the thinner wood; and, unfortunately, this is a contingency which arises only too frequently in the handling of fruit in transit.

Package of considerable value in the transportation of pears to Europe: It consists of three trays joined together by an external cleat fastened to each corner. These trays have been used with success in the export of pears from Victoria to London, and I am informed the Tasmanian growers have also adopted the principle in their oversea trade. As far as I am aware, the only grower who thus far has adopted these packages here is Mr. G. R. Laffer, of Belair, through whose kindness I have been able to figure them here. I would suggest the trays should be made of such dimensions so that when three are united, as shown in our illustration, a package will be formed with proportions equal to those of the Peacock apple case. To attain this end they should be made as follows: The sides be composed of battens $19\frac{1}{4}$ in. long, 3 in. wide, $\frac{3}{8}$ in. thick. The lids—one of which is required for every three trays, should be composed of four pieces, two of which should be $19\frac{1}{4}$ in. long by $3\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick, and two $19\frac{1}{4}$ x $3\frac{1}{2}$ x $\frac{3}{8}$. The bottom of every third tray should be made of exactly similar dimensions, while that of the other two trays should be made of four pieces, each $19\frac{1}{4}$ x $3\frac{1}{2}$ x $\frac{3}{8}$. The variation in thickness will give the ventilation described as having proved so successful in connection with the Peacock apple case. The ends are each composed of three pieces $9\frac{1}{4}$ long x 3 in. x $\frac{3}{8}$. The four cleats (one used at each corner) each measure 9 in. x 3 in. x $\frac{3}{8}$ in.

When packing the pears a tray with the two $\frac{1}{2}$-in. battens on the bottom is packed first. The fruits are each carefully wrapped in a piece of tissue paper and packed into wood wool—long pears on their sides, short ones upright. When the tray has received its complemnet of fruit, wood wool is carefully packed between them, and a good thick layer placed over the top. The second and third trays are packed similarly and placed in a pile. The lid is then nailed on to the top tray, placing the $\frac{1}{2}$-in. thick battens on the outer sides. The ends of the three trays are then adjusted and the cleats nailed on, taking care that, while the nails take a "dove-tailing" direction into the wood of the trays, they shall not penetrate to the fruits.

FRUIT AS A REMEDY FOR GOUT.

While the staunch vegetarian holds strong views with regard to a diet of fish, flesh, or fowl being more or less poisonous to the human system, the fruitarian does not regard with special favor the fare which the former individual considers indispensable to health. To fruitarians uncooked fruit is the only natural food, and they put their views into practice by limiting their diet to fruits. The chief opponents to an exclusively fruit diet have been the medical men, who contend that such a diet is not suitable in a cold country such as the United Kingdom. With regard to gouty persons, they have long contended that, in the case of persons who suffer from gout, the liberal use of fruit is attended with considerable risk, and some have asserted that the consumption of fruit has a tendency to develop the disease in healthy persons. Now the pendulum shows signs of swinging the other way, and we shall not be surprised to find in the medical journals a strong advocacy of a diet of sylvan simplicity. One medical man has already declared that he has frequently cured gout with grapes and oranges, and he declares that his advice to gouty patients is "Eat plenty of fresh, ripe, uncooked fruit." While the prices of fruit assist in the elimination from the system of gouty tendencies, the fact must not be overlooked that the consumption of fruit in large quantities may prove injurious to patients who have for any considerable period regarded the juicy pear and luscious grape as articles of diet to be carefully avoided. We are, therefore, strongly of the opinion that in making a change in the diet for the purpose of giving a place to fruit, it is advisable to proceed slowly. There can be no question whatever that liberal supplies of fresh cooked and uncooked fruit are highly beneficial, but extravagance in eating fruit, as of other articles of food, should be avoided, for excesses are not only likely to prove injurious to those who indulge in them, but they bring the fruit into undeserved disrepute.

Vegetable Garden.

OPERATIONS FOR MARCH.

By W. S. Campbell.

It will be desirable now to look ahead a little, even to late autumn and winter, and arrange operations for the future. This will save a great deal of time and muddling. With a little practice in your particular locality, it will not be difficult to discover the length of time each kind of vegetable should take, under the ordinary conditions, to attain its perfection, or when it should be gathered for use, or when it has finished producing its seeds, such as the pea or bean. A rough idea will do, so as to enable you to be prepared for clearing away all useless stock, and replanting or resowing something else. If plants such as the cabbage, cauliflower, Brussels sprouts, savoys, or broccoli are badly sown and improperly treated afterwards, you will probably find that there is no regularity in their arriving at maturity. Be advised, and carry out the smallest operation methodically. Sow your seeds thinly; prick out the young plants to enable them to gain strength and grow stocky, then plant out all those of the same size in one bed, then the chances are that these will be all ready for use fairly well about the same time. But a family does not want to demolish a large bed of cabbages or cauliflowers within a day or two, therefore you should regulate sowing and planting in such a manner that a continuous supply be kept going in such quantity as may be required.

Beans.—All kinds of beans, except the broad or Windsor bean, may be sown as extensively as may be required, and all old beans which are no longer bearing should be removed, and some other kinds of vegetable sown or planted in their places. Mr. Dunnicliffe tells me that he is inclined to think that the new climbing French bean called Carter's Ten Weeks is likely to prove well worth growing. He finds that it grows about 4 ft. high, and is very productive. The bean pods are very fine and tender. It is worth a trial.

Beet (Red).—Sow a few rows of this vegetable, which is so good that no one with a vegetable garden should be without it. The globe varieties are the best kinds to grow, and are likely to keep their shapes better than the long-rooted kinds. Sow the seed in drills about 18 in. apart. As the seed generally takes a long time to germinate, or "come up," it had better be soaked in water for a few hours before sowing; and then the ground had better be watered well after sowing, that is if it be dry. If nice and moist, you need not bother about the watering. Should the seeds come up thick, thin out the plants well so as to give them plenty of room to grow. Use a hoe of some kind pretty freely amongst the beets, and they should grow well and speedily.

Beet (Silver), sometimes known as spinach, is a fine vegetable, and a most useful one for summer use. The seed may be sown in a seed bed, and the young beets planted out when they are large enough to shift; or it may be sown in drills like the red beet, if preferred. The soil should be made rich with good manure for this vegetable, and if some liquid manure be supplied during its growth occasionally, if it does not seem to be growing as it should, it is likely to be much improved.

Kale, known also as Borecole, is a good and useful vegetable, which will sometimes succeed well where its relative the cabbage will not do nearly so well. It prefers cold climates to warm and dry, and if it be just touched with frost it will be improved for the table. It is not often grown here, but it deserves a trial. Like all the cabbage tribe, it is a gross feeder, and needs good soil, or abundance of manure, if it be desired to grow it to perfection.

Cabbage.—There should be sufficient young cabbages on hand for successive plantings during the month—a few at a time. This successive method is a perpetual motion sort of business. Once get it in order it is easy to manage. It has a parallel in Mr. Ellis' duck farm at Botany, where ducks are always laying, eggs always hatching, birds always maturing and always being sold off. Sow a little seed; plant pricked-out plants which are large enough to a heavily manured bed. Take plenty of physical exercise with some sort of a hoe amongst the cabbages, and the plants will probably attain great perfection. The best hoe to use for a small garden is a medium-sized Dutch hoe kept in good order. For a good-sized garden obtain a Planet farm hoe, which is an extremely useful implement, for with its various attachments all sorts of operations can be carried out at a minimum of labor.

Cauliflower and Broccoli can be treated in much the same way as cabbage. Both are great feeders, and need good manure in abundance, and they should be grown without any check whatever. It is worth while taking some extra care with these vegetables, for they will well repay it. Sow seed of both, but not too much at a time.

Celery.—Sow a very little seed in a pot, seed-pan, or box. A kerosene tin will serve the purpose just as well, if not better, but some holes should be made in the bottom, so as to allow surplus water to drain away. Seedlings should be pricked out like cabbages for transplanting when they have grown to a height of 6 in. or so, or they may be moved when very much larger; but a good many of the roots and leaves should be trimmed off before planting. Earth up well-grown plants, taking care not to allow any soil or dirt to fall in between the leaf stalks. Use liquid manure occasionally, and plenty of water if the soil is at all dry.

Rhubarb.—Those who would care to raise rhubarb plants from seed can do so this month. The plants raised now will be ready for putting out in the early spring.

Tomatoes, egg-plants, okra, and capsicum seeds also may be sown if supplies are required. These seers had better be sown without delay.

Leek.—Plant out a few, if any young leeks are ready to shift. Feed all growing leeks liberally, for they are greedy feeders and need abundance of water if the soil be at all dry. Sow a little seed.

Radish.—Sow a little seed occasionally during the month, and make use of the radishes whilst they are young and tender.

EFFECTS OF FERTILISERS ON SEED GERMINATION.

Since the importance of a scientific investigation of the various problems of plant life has been fully recognised numerous experiments have been made for the purpose of ascertaining the means by which the germination of seeds can be the most readily accelerated. Apart from hastening the germination of the seed in the soil, it has been felt that a knowledge of this kind would be useful in enabling seedsmen and cultivators to ascertain within a comparatively short time the percentage of seeds containing the requisite vitality previous to sowing or selling it, as the case may be. In the course of the experiments that have been conducted during the past quarter of a century, the treatment of seeds with various chemicals has perhaps received the largest share of attention. The results obtained suggested the enquiry into the influence of chemical fertilisers on the germination of the seed when the seed and chemical compound are distributed along the drill simultaneously, in accordance with the practice which obtains in sowing certain crops. The question to be answered is, is the practice beneficial or otherwise? This question is of greater practical interest to agriculturists than horticulturists, but it is one that has a bearing upon the work of the garden. As far back as 1876 the late M. Henri de Vilmorin endeavored to elucidate this point, and in the course of his experiments he found that when the surface soil contained a material proportion of nitrate of soda or sulphate of ammonia a considerable percentage failed to germinate, while the remainder germinated very slowly. Other experiments were made by this distinguished horticulturist, and these were conducted in pots containing soil to which various chemical fertilisers had been applied in proportions varying from 0·5 to 5 per cent. According to these the germination of wheat and beet seeds was retarded when the nitrate of potash, nitrate of soda, and phosphate of lime was equal to 5 per per cent. When the nitrate of soda was equal to 10 per cent. the whole of the wheat and nine-tenths of the beet failed to germinate. These percentages far exceed those which would be found in the soil, except when the seeds and fretilisers are drilled simultaneously, in which case they may be closely approached. Subsequently some experiments were conducted by MM. Claudel and Crochetelle under conditions similar to those which obtain under field culture. The results obtained from these showed conclusively that potash salts retarded germination, and that sulphate of ammonia and nitrate of soda had an injurious effect. Phosphates, in the form of superphosphate and slag, which are acid and alkaline respectively, were tested, and the superphosphate in the proportion of two parts to one thousand parts of sand accelerated germination, but reduced the percentage of plants obtained. On the other hand, the slag appears to have materially promoted germination, more particularly in the case of leguminous plants, and the favorable effects of the slag is considered to be due to the alkaline properties checking the way of phosphoric acid given off by the seeds in the process of germination. More recently still, numerous experiments have been conducted under the auspices of the United States Department of Agriculture. In these experiments, to which we can only briefly refer, the fertilisers used were muriate of potash, nitrate of soda, lime made from powdered oyster shells, and bone black, rendered soluble by treatment with acid, and a double set of trials was made—one in which the fertiliser was mixed with the soil, and the other in which it was placed in contact with the seed. Except in the lime experiments, germination was throughout retarded when the fertilisers were in direct contact with the seed, while a larger percentage of plants was obtained where the fertilisers were mixed with the soil. The general conclusions, based upon the American experiments, are, briefly stated, as follows:—(1) Muriate of potash and nitrate of soda, used at the rate of one per cent. and upwards, are more or less injurious in their effect on germination, whether mixed with the soil, or in contact with the seed. (2) Phosphates are less injurious to germination than muriate of potash and nitrate of soda, and if not in excess may be harmless. (3) Artificial fertilisers should not be brought into direct contact with germinating seeds. (4) The effect of treating seeds with chemicals before sowing is no indication of the action of these chemicals when used as manure. (5) The chief injury to germination from chemicals is inflicted upon the young growths when they leave the seed coats. (6) It is improbable that either potash, phosphates, nitrates, or lime actually promotes germination. The results that have so far been obtained both in Europe and America show that the use of chemical fertilisers for the promotion of germination, while it can do no good, may prove disastrous.

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Answers to Correspondents

"Daphne"—In answer to correspondent C. Johnson Hamilton, I presume you mean Daphne Indica. I would advise you to adopt the simpler way to raise a stock of Daphne Indica by layering in early autumn. Tongue them in ripened wood and peg them down securely in nice sandy soil. To take cuttings, take ripe wood in early autumn and insert cuttings round edge of cutting pot half filled with drainers, and using any nice sandy soil Make firm cover with a bell glass and place in cool frame or greenhouse till the spring. A box with a pane of glass to fit would do instead of pots and bell glasses. In the spring they ought to be calloused and then pot them up singly in small pots and place on a gentle hot bed to help them to root. Keep frame close till rooted. They are slow and rather difficult to root, wanting attention so many months that layering is the better and surer way of raising a stock of Daphne Indica.—D.C.

"J.H."—Hyacinth bulbs may be planted from April to June, The ground should be well dug with a liberal supply of cow manure.

"Cottager"—The culture of Gladioli is in no sense difficult. This month is a good time to plant, but as a matter of fact they can be planted at almost any time of the year.

"Sun"—Fuchsias are hardy plants and do well in the open garden, but must be sheltered against hot winds and too much sun. A sheltered position suits them best, and they will take a large supply of cow manure,

"Novice"—Budding Roses can be gone on with now, and after a little success with this simple process you will find it very captivating.

"W.M.G."—One of the prettiest ornamental trees we can recommend is Jacaranda. The foliage is very graceful and the rich blue flowers are very handsome. It is quite hardy. Plant next month.

"Z."- For flowers that require but little attention and give very satisfactory results we can recommend Pelargoniums. The double flowering varieties have splendid colors and give abundance of bloom. What are known as Ivy Geraniums are amongst the best of plants for rockeries. The Zonales should be cut back this month to keep the bushes shapely.

"Pet"—Sow seeds of Petunias in pots or pans this month.

"Star"—We know no flower better for cutting than China Asters. They will keep bright and good for a fortnight.

"Scent"—One of the sweetest scented shrubs is the Diosma. It will grow anywhere. The name is derived from Dios, divine, and osme, odour, from its powerful perfume.

The Flower Garden

OPERATIONS FOR APRIL.

Having had very little summer weather during March, those flowers that usually wilt and die off rapidly are still blooming strongly, and with care may be kept going during April if the mild weather continues. Moving about amongst the plants with a pair of shears to cut off the dying blooms and straggling shoots, picking the seed pods, and generally tidying up is the work for the month. In addition to this tidying business, the Cannas, of which there are now some charming blooms, should be ticketed and selected for next season. The same also with the Dahlias, which will go on blooming for some time yet. The selection of best varieties for color and form should be labelled, and the corms put out from the average ones that may only be kept for filling up next season. A little care in the selection of colors is most useful for planting out next season. The grouping of colors makes a great difference to the general effect of bedding, and it can only be done by a little systematic selection now that the colors are showing.

Chrysanthemums are coming later this month than usual. Watering requires most care with them, and general advice can hardly be given safely where the rainy changes come as they have been doing almost weekly. The plants must be persistently watched in the open beds. The bursting buds will take liquid manure two or three times a week, according to the strength and general health of the plant. The liquid should be alternated with pure water. We need hardly offer advice to show growers regarding disbudding.

Planting bulbs may still be continued early in the month. We would like to see the lovely Tulips come more into favor. Daffodils we know have come to stay, and the selection from any nurseryman's catalogue will gratify the most exacting choice. Then there are the Irises, Amaryllids, Ranunculi, Anemones, Snowflakes, Babianias, Ixias, Tritonias, Scillas, Agapanthus, Alliums, Lachenalias, Moreas, Watsonias, Crinums, Tropæolums, Clivias, and a number of others.

Herbaceous plants, such as Pentstemons, Antirrhinums, Hollyhocks, Gaillardias, Petunias, Fuchsias, Verbenas, and Calceolarias, may be propagated from cuttings and offsets.

Seeds may be sown of hardy annuals for early spring, such as French and Shirley Poppies, Lupins, Phlox, Lobelia, Nemophila, Stocks, Delphiniums, Minor Convolvulus, Cornflowers, Coreopsis, Candytuft, and Dianthus.

This is the month for planning out new gardens and making alterations in old ones. Many cottagers are content to leave the old garden as it has been for years. That is a mistake. A little alteration here and there, a new idea, a new permanent shrub, will put new life into the place. The gardener will be surprised at the effect of something new in the plans. It is like putting on a new suit of clothes: it gives a different feeling, and the new plants where there were none before make the place, perhaps, only a little different, yet pleasantly noticeable. Variety is a great charm in gardening. Bud a new Rose out to an old Stock and interest is at once aroused in its development and ultimate blooming. Now is the time to do all these things.

DESIRABLE GARDEN ANNUALS.

By Robert Cameron.

"New York Florists Exchange."

The Flax family contains the North African red flax, Linum grandiflorum. This is a good annual when grown in masses, and its large red blossoms are very effective.

In the Geranium family there are some very useful and important annuals. The well-known tropæolum and balsam, which are indispensable, being here. Limnanthes Douglassii is a California dwarf plant, with yellowish flowers, and makes beautiful edgings in an open sunny position.

The most important genus among annuals that are grown for their flowers in the large pea family is Lathyrus odoratus, the sweet pea. The attention given lately to this plant has resulted in a great advance in the size of the flower, and the addition of new shades of color that were unknown a few years ago. They possess all the good qualities a flower needs for cutting purposes. They are graceful in form, have brilliant colors, slender stems and delicious perfume. Lathyrus tingitanus is a very ornamental annual, with large purplish-red flowers, and ought to be more common than it is now. The annual lupines are handsome and of various colors, and are easy to grow, doing well in any common garden soil. Some of the best kinds are luteus, superbus, pubescens, manus, mutabilis, and Cruckshankii.

Last summer the sensitive plant was tried as a new bedding plant. It grew luxuriantly and blossomed freely during the summer, and proved very interesting to visitors, who liked to touch the sensitive leaves.

Although the Rose family has so many valuable trees, shrubs, and herbaceous plants, yet it has few annuals that are worthy of consideration here.

The Stone Crop family has two sedums that are worth mentioning. Sedum Torreyi is a dwarf plant, with yellowish flowers; S. azureum is also of low growth and has blue flowers. Both of these plants are well adapted for dry places on light sandy soil

The annual cupheas are worth growing for variety sake, and belong to the Loose Strife family.

We have come now to the Evening Primrose family. The first plants worthy of notice are the clarkias. These Californian plants are among the prettiest of annuals, they are so robust, of easy culture, and flower for a long time. Clarkia elegans grows about two feet high, erect in habit, much branched, and bears long, leafy racemes of flowers varying from purple to pale red, or a salmon color. There are some good double-flowered varieties of this plant. Clarkia pulchella is different from the other species in having deeply cut petals. This plant varies in height from one to two feet, and the color of its flowers varies from deep purple to pure white. There are good double forms of this plant also. You will find in seed lists quite a number of varieties; they are all worth growing, as they are distinct from each other. A near relative of the clarkias is Eucharidium concinnum. It attains a height of one foot and has rosy purple blossoms. E. grandiflorum and E. Breweri are good plants. When they are grown in masses they are showy and are in blossom for a long time.

The well-known godetias belong here and are among some of our showiest North American annuals. Godetia grandiflora and G. amœna are the two best species. There are many beautiful varieties of these plants, which are very showy.

The Gourd family is interesting on account of their curiously shaped and ornamental fruits. They always attract attention, and if trained to large, rough stakes, where their fruits can hang down and be seen to advantage, there are few plants that will attract more attention.

Among the Fig Marigolds we have two showy annuals, Mesembryanthemum pomeridianum and M. tricolor; they are well adapted for growing in dry, sunny spots.

In the Parsley family, where we have quite a number of good perennials, I know only of one good annual in the family that is worth growing in the garden. Trachymene cœrulea is the name of the plant. It grows about a foot high, and has showy, blue flowers, which are produced in good-sized umbels at the end of the stems. Although a good annual it is seldom seen outside of botanic gardens. It is a native of West Australia.

The next family of importance is the Teasel family; here we have the well-known Scabiosa atropurpurea. Its flowers are of various colors, and are very useful for cutting. There are several other species that are worth growing, such as S. macrantha, prolifera, Sibthorpiana, tenuis, and vestina.

The Composite family is the most extensive order of flowering plants, and here we will find a large number of useful and showy plants from different parts of the world. But time will not admit of taking them all up, so we must deal with the most showy ones. Baeria carysostema and B. coronaria are dwarf Californian plants, with numerous small yellow flowers. Barkhausia rubra and its white variety has flowers of good size, and are good for cutting. This plant ought to be more grown; the white form would be good for florists' use. The Swan River daisy, Brachycome iberidifolia, is a compact, dwarf Australian plant. It grows about a foot high, and has small cineraria-like flowers, which are produced in loose, terminal clusters, and are of various shades of blue and purple; one form has white flowers.

The calendulas are natives of the south of Europe, and are so useful and well known that we could hardly do without them now. Centaurea Americana is one of our very best native annuals belonging to this family, but is very seldom seen in gardens. It grows from two to four feet high and has large, handsome, pale lilac flowers. four inches in diameter. Centaurea cyanus and all its forms are desirable. Centauridum Drummondii, from Texas, has good-sized flowers of a clear yellow color; it grows about three feet in height The annual chrysanthemums, carinata from North Africa and coronaria from Southern Europe, with all their varieties, deserve to be grown extensively, as they are so useful as border or bedding plants, and are excellent for cutting. The best of the coreopsis are Drummondii, tinctoria and its varieties. cardiminifolia and coronata. The well-known Mexican Cosmos bipinnatus is one of our best late autumn annuals. Emilia sagittata is a pretty dwarf plant, with small yellow flowers, from the East Indies.

Among annual sunflowers, Helianthus cucumeriofolius is the best; its flowers are produced very plentifully and are useful for cutting. The Australian everlastings, helichrysums, are ornamental in the garden and are prized when cut and dried for winter decorations. Other useful and decorative annuals in this family are Lasthenia, glabrata, Layia elegans, Lepachya columnaris, podolepsis, acuminata, and gracillis, Rhodanthe Mangiesii, Sanvitalia procumbens, French and African marigolds, zinnias, gaillardias, and China asters.

In the Lobelia family the beautiful dwarf Lobelia erinus, from the Cape of Good Hope, with its azure blue flowers, is always pleasing when in blossom and well adapted for edges for beds. Downingia pulchella, from California, belongs to this family, and is a dwarf plant with pretty small blue flowers.

The Campanula family has two good annuals, Campanula Loreyi and C. macrostyla, Venus' looking-glass. Specularia also belongs here.

Leaving a number of families, the next important one we come to is the Phlox family. Phlox Drummondii deserves to head the list, as it is so beautiful and its colors are so varied and brilliant. The collomias and gilla are dwarf, showy annuals that are well adapted for growing in masses.

The Water Leaf family contains the beautiful Californian phacelias, which have dense heads of small blue or violet flowers. The best of the species are campanularia, congesta, Parryi, tanacetifolia, and Whitlavia. The Nemophilas are lovely Californian plants, but I have had very poor success with them, although I know they are one of the easiest plants to grow in British gardens.

SHRUBS.

Weigelas.—We must warn amateurs that so-called improved varieties are seldom as hardy and not always so manageable as the types from which they are derived. For general planting we know no Weigelas superior to W. floribunda, W. roses, W. nivalis, W. grandiflora, and W. Hortensis

Exochorda grandiflora is another very conspicuous flowering shrub. It attains a large size, but is not in this country a very long-lived plant, and seldom sets any seed, so that it is still rather scarce. We have planted two groups of Exochordas in prominent places where we needed a "high light" in the landscape. Each group consists of three plants forming an irregular triangle, the bushes about six feet apart. They grow tall and rather straggling, with slender, irregular branches, covered with an abundance of quite large paper-white blossoms. The flowers are more delicate than the trumpet shaped bloom of Weigelas, and do not last so long.

The Snowball is a very familiar example of the conspicuous shrub, but should be used with care as it does not harmonise with smaller flowers. Neither does it look at home in the wilder and more woody parts of the park or home grounds. Its place is near the house or in the old-fashioned garden, or on the well-kept lawn, where groups of snowballs, pruned into symmetrical shape, are very effective.

All the Viburnums are fine shrubs and should be planted more than they are V. prunifolium, the Black Haw, is very beautiful in bloom. It has re-curving, spreading branches, plum-like leaves and numerous clusters of white flowers in spring. All Viburnums, except the two "Snowballs," are adapted to the wilder parts of the grounds, though some of them, such as Viburnum molle and Viburnum pubescens make fine specimen plants for the lawn. V. molle flowers at midsummer.

Perhaps the most beautiful of the hundreds of shrubs planted at Rose Brake is a tall, stately specimen of Xanthoceras sorbifolia, which may almost be called a small tree. It is now about ten feet in height, and is clothed down to the ground with branches that put on a fairy-like garment of softest white bloom. The blossoms come before the leaves have fully expanded, and are large, bell-shaped, and upright in habit of growth. They are white, with luminous greenish-yellow centres, and these centres have the singular faculty of deepening day by day during the blooming period, first to lemon yellow, and then gradually changing to an unusual shade of deep salmon red. The flowers last in perfection a week or ten days, and the little tree is the glory of the garden until it fades. I hope to see this very beautiful shrub more generally planted. It has fine foliage, of a clear, light green, and is an exceedingly ornamental plant even when out of bloom.

All the Hydrangeas have large showy flowers. The best among the hardy kinds are the oak-leaved Hydrangea, a noble shrub, and the familiar H. paniculata grandiflora.

Flowering Quinces or Cydonias are beautiful objects in the spring, especially the bright scarlet and the pure white kinds. Cydonia Moerlosii has exquisite flowers of shaded carmine, and there are varieties that have bloom of a conspicuous orange-red, such as Cydonia aurantiaca, which ought not to be planted near Lilacs or shrubs with rose-pink flowers.

I believe I have mentioned the most ornamental of this class of plants, but there remains much to be said on the subject of conspicuous small trees and vines. This will have to be deferred to some future day.—" Park and Cemetery."

IMPROVING THE HOME GROUNDS.

> "Who sows a field or trains a flower
> Or plants a tree is more than all,
> For he who blesses most is blessed;
> And God and man may own his worth
> Who toils to leave, as his bequest,
> An added beauty to the earth."
>
> WHITTIER.

If that is so—and who can doubt it—workers gain dignity from the thought and from the source of the idea, for surely Whittier was written down as one who "loved his fellow men," and it is sometimes intimated that their names head the list. Consequently, all should feel good grounds for encouragement and even for enthusiasm. Indeed, my feeling is that earnest workers in this line are bound to develop enthusiasm —let me counsel that it be not allowed to dominate good judgment.

It has been justly said by Professor L. H. Bailey, of the Cornell University Agricultural Experiment Station, that "the trouble with home grounds is not so much that there is too little planting of trees and shrubs, but that this planting is meaningless"

The truth is that every dwelling with its surrounding grounds, no matter whether large or small, should be a complete picture in itself, and this picture should be of such character that its entire effect and purpose will be evident at the first glance. The general effect must be such that the observer notices it—the sum total—rather than any of its details. Therefore, the design is seen to be the most important step in improving home grounds.

The dwelling is the most important feature, therefore it must dominate the picture and everything else must be subordinated to it.

To this end the proposed planting must first be considered as masses of foliage, and these must be designed to form a background and setting for the house and a frame for the grounds.

It is quite possible to develop almost any desired special minor feature of planting within these masses without disturbing the effect of the picture as a whole.

After fixing in mind the difference between the "nursery" and the "pictorial" type of planting it would be helpful to observe grounds and dooryards. Place each in its class, and mentally (or on paper if you will) remodel them, deciding what can be done merely by a rearrangement of the material already in use, as well as by adding fresh plants as the necessities seem to your mind to demand, or by replacing some of the plants on hand with others that better meet existing requirements. This is good practice and will lead to a clear understanding of what your own grounds need as well as prepare you to intelligently advise others.

In making this picture of home comfort, there must be an open centre so that the dwelling—the central idea and chief feature of the picture—shall be visible. On a small place, therefore, trees that are intended to furnish shade must be placed outside as street trees or at the back where they will make a background of foliage. Small trees and the largest shrubs must be placed at the back of the beds that are to form the boundaries of the yard and the frame for the picture, and those of lower growth on the inner, irregular edge of the beds next to the lawn; and along this inner edge flowering perennials may be introduced at intervals. The shrubbery belts must be not only irregular in width but also in height.

CASTOR OIL PLANTS IN ENGLISH GARDENS.

Few foliage plants can equal the various species and varieties of Ricinus when well cultivated for summer bedding, but with them, as with everything else, a proper mode of treatment is required to bring them to perfection. The past three seasons have been most favorable for the development of fine growth, and here the striking beauty of both flowers and fruits of castor oil plants has been greatly admired. During the past two seasons we have ripened seed of several sorts, a somewhat unusual occurrence, I think, for this part of the country.

There are now very many castor oil plants in cultivation, and some of these introduced during the past few years are unquestionably improvements on many of the older kinds. We have grown them for some years here rather extensively, and, I think successfully. I propose, therefore, to give my mode of treatment for the benefit of those who may not be acquainted with the requirements of these plants. Seeds should be sown about the middle of February, in a strong heat, and preference should be given, when conveniences will allow, to starting them singly in small 60-sized pots, using a light porous mixture. Pot the seedlings into six-inch pots as soon as ready, and grow them near the glass in a stove temperature. The plants must be gradually but thoroughly hardened previous to planting out, which should take place the first week in June. The position should be a sheltered one, choosing a north or north-west border where they will obtain all the sunshine possible.

It is quite useless to expect the plants to give the best results unless the ground has been thoroughly trenched and heavily dressed with farmyard manure during the previous winter, as the Ricinus revel in a deep rich soil, and only in such a medium can they grow to perfection. Before planting, the ground should be forked over. Either grown in separate beds or dotted about in the sub-tropical border, the castor oil plants are splendid subjects. Plenty of room must be allowed them, in fact they should stand perfectly clear of each other and of other plants. They will require to be securely staked and tied, and abundance of water must be given during dry weather.—"Gardeners' Magazine."

BULBS.

DAY LILY (Hemerocallis Hybrids),

The following is a brief descriptive account of the Hemerocallis or Day Lily hybrids which have been raised and have flowered at Clifton Cottage, York.

H flava crossed with Middendorfii resulted in a hybrid that was named Apricot. It obtained an Award of Merit from the R.H.S. at the Temple Show in 1893. It first flowered in 1891, and was awarded a certificate at York in the following year.

H. Graminea crossed with Middendorfii (probably) was named Frances. It first flowered in 1892, and obtained an Award of Merit from the R.H.S. in 1894. I do not feel sure about the parentage of this. It is dwarf, and grows very feebly with me—in fact, I have but one plant left. H. graminea has the same objection to living in my garden, though when the plants are transferred to the York nurseries they grow well enough.

H. flava crossed with Sieboldi (syn. Dumortieri and rutilans) gave a number of seedlings which for garden purposes need distinct names, although they have more or less a family likeness. Beauty is of a better shape than most of the seedlings from this cross, being more in the style of Apricot. The three outer petals are dark (maroon) at the back; the three inner ones broad, and of a good yellow. Plant comparatively dwarf. Patience is tall and branching, with the habit of H flava. The flowers are a little paler in color than H. Sieboldi, and stand well above the foliage. There are five to nine flowers on a stem. This variety must be established before it will do well. Flame has orange colored flowers, the three outer petals having maroon on the back. The buds are also maroon in color. The flower-stems are not so tall as in Patience, but yet stand well above the foliage. Flame is very effective in a mass, and has an excellent constitution. William Dean may be described as an orange flava. The buds show traces of Sieboldi coloring, but the open flowers, four to nine on a stem, have very little maroon on the outside. The plant has not so branching a habit as Patience. W. A. Clark is another orange flava, but quite distinct from William Dean The only trace of Sieboldi is to be found in the scent, which is much the same as that of Sieboldi. Though this plant appeared among a batch of flava and Sieboldi seedlings I should have been doubtful of its origin if it had not been for the scent of the flowers, though it is, of course, undesirable to multiply names. Yet I have a number of seedlings from this cross which may eventually require to be so distinguished for garden purposes. These include one, perhaps paler in color than flava, with maroon backs to the outer petals.

H. Thumbergi crossed with disticha (single-flowered).—I showed, under the name of Pioneer, a blossom obtained from this cross at the Hybrid Conference in 1899. Next year the same plant produced a larger flower, and more than a dozen seedlings of the same parentage have produced blossoms. The flowers vary considerably, some being much rounder than others The finest of all is a really handsome flower about four and a half inches across. Some have the halo round the centre of the inside of the blossom which the cross was intended to obtain. There will probably turn out to be at least three plants sufficiently distinct for garden purposes to deserve separate names. I have a nice batch of seedlings of the same cross a year younger. This year H. disticha had not sent up any flowers when H. Thumbergi was in full blossom, so that no hybridising of these two species has been possible this season.—G. Yeld.

THE TIGER LILY AND ITS VARIETIES IN ENGLAND.

With the advent of the month of August the first of the tiger lilies unfold their blossoms, and for some weeks the different varieties form one of the showiest outdoor features in the garden. They are in many ways a very desirable group of lilies, being perfectly hardy, not at all fastidious as to soil or situation—though they do best in a well-drained loam—and can be increased to almost any extent by the small bulbils that are borne in such numbers in the axils of the leaves. Besides this, good flowering bulbs can be purchased at a very cheap rate, being largely grown by the Dutch, and a very desirable feature of this lily in all its forms is that it flowers well the first season after planting, which is more than can be said of many lilies. In planting the tiger lily no indiscriminate dotting here and there should be indulged in, but good bold groups which are extremely effective should be the aim, as a breadth of well-flowered plants is conspicuous for some distance from the brightness of their coloring.

After seeing plants in bloom, at which time the sturdy spike carries a large head of blossoms one is very apt to be disappointed in purchasing bulbs, as they are sometimes so small as to lead one to think that flowers will the following year be sought for in vain. It will, however, be found that bulbs not more than an inch in diameter will flower in a perfectly satisfactory manner; indeed, bulbs from one and a-half inches to two inches in diameter may be regarded as very fine. Exception must, however, be made in the case of one variety, viz., L. Fortunei, as grown in Japan, and which is sometimes sent to this country in the company of Lilium auratum and L. speciosum. These Japanese bulbs are the largest that have ever come under my observation, and they yield a corresponding wealth of blossoms, the flowers, which are rather paler than in some of the others, being often disposed in a large pyramidal-shaped head. The typical Lilium tigrinum (the Tiger Lily of gardens), which was introduced from China in 1804, is a well-known lily, of which there are at least three well-marked varieties in cultivation, all of which are readily obtainable from dealers during the winter season.

The first is L. Tigrinum flore plena, which furnishes the best example of a double-flowered lily that we have in cultivation. To many, myself among the number, the single flower is far more beautiful, but still the fact must not be ignored that double blossoms are admired by some. In this form of the tiger lily the flower is composed of an unusual number of petals, which overlap each other in a regular manner, and thus form a symmetrical bloom. Another example of a double lily is the early flowering L. elegans staminosum, but in this case the interior of the cup-shaped bloom is filled with enlarged petaloid segments, a totally different arrangement from that which prevails in the double tiger lily. This last was introduced from Japan just over thirty years ago, and in a catalogue of that date it is, I see, priced at one guinea a bulb. L. tigrinum splendens, also known as Leopoldi, is the next variety to mention, and in some respects at least it must be regarded as the finest of them all. It differs a good deal from the ordinary tiger lily in the leaves being fewer in number, broader, less woolly, and of a deeper green, while the stem, which is in the others clothed more or less with a whitish wool, is in this variety quite smooth and dark-colored. The flowers of splendens, too, are larger and brighter colored, while the spots are fewer in number and larger. It is also slightly later in blooming than the common form. Where lilies are grown in pots for conservatory decoration, this is far and away the best of the tigers for this purpose, as under such conditions the foliage is retained better than in any of the others, for their leaves are liable to go shabby under pot culture. Three bulbs may be put in a six-inch pot, and in this way they form effective specimens.

L. tigrinum Fortunei was alluded to above in reference to the large bulbs sent from Japan. It is the last to flower of the tiger lilies, and is characterised by an excessive woolliness of the leaves and stems. The flowers, too, are rather paler than the rest, and in the case of this large Japanese form the distinct pyramidal shape of the flower head is another noticeable feature. The bulbs are particularly firm and solid, hence they stand well the long journey from Japan, and reach here in good condition. A near ally of the tiger lilies is a pretty Japanese species known by the names of L. Maximowiczi, L. jucundum, and L. pseudo-tigrinum. It is a pleasing, slender-growing lily, whose bright red flowers are thickly dotted with dark brown. A distinguishing feature of this lily is the absence of bulbils in the axils of the leaves, such as occur to a greater or lesser extent in all the tiger lilies.—W.T.

DIANTHUS CRIMSON BEDDER.

This is a rival of Napoleon III., but it must be said that it is far inferior, and its only claim to be preferred is that it makes plenty of grass and is thus easily propagated. I recollect seeing it presented for honors at a meeting of a leading horticultural society—and not receiving them, simply because it was neither new nor superior to the gloriously colored Napoleon III.—A.

ROSES.

AUTUMN FLOWERING ROSES.

Now that there are so many Roses of value for autumn flowering, a selection of the best should prove of much assistance to all who are planting mainly for the autumnal display. The lengthening nights, coupled with heavy dews, give to the semi-double Roses a wonderful decorative value, for such varieties expand freely, yet the developed blossoms remain on the plant for a considerable time, so that we have a more profuse display in April and May than we get in October and November from the same varieties.

No list of autumnals can be complete without the lovely G. Nabonnand, its very large petals, of a pale rose flesh tint, and long, elegant buds, combined with fine growth, making it one of the most desirable. Then how brilliant are the buds of the fragrant Gruss an Teplitz, some of the flowers having the beautiful velvety shading of Duke of Edinburgh, and, moreover, the colored foliage is an additional charm to this glorious Rose. Camoens is not yet surpassed as a bright rose-pink for massing, and Marquise de Salisbury is certainly one of the brightest Roses and of even growth. Both of these last-named are extremely showy on the plant, and by pruning hard each season a more uniform growth and also a more regular blossoming are secured. Corallina, Enchantress, and Sulphurea are a trio of beautiful kinds, the first even more vigorous than the old pink monthly, and it has huge coral-colored petals and long, brilliant buds. Enchantress, with its half-drooping, globular flowers of a delicate creamy yellow, and Sulphurea, clear and bright sulphur yellow, are colors much desired. All three are really excellent, and should be largely planted for massing. Mme. Pernet Ducher is a never-failing source of delight, and Killarney gains more admirers each season. The old and well-tried Marie Van Houtte, its carmine-tinted petals being richer in autumn than in the height of summer, and Mme. Abel Chatenay are both vigorous and would make worthy companions. This latter Rose somehow compels admiration, even from those who cannot bring themselves to like these decorative Roses. What a strange taste, to be sure! But I have known individuals who can only admire a show bloom of the perfect symmetry of an A. K. Williams or a Mrs. John Laing Viscountess Folkestone is still one of our best autumnals, and it has a worthy companion in Grand Duc de Luxembourg. Marie d'Orleans is also first-rate, and as hardy as it is good. Papa Gontier has most shapely buds and smooth blossoms, and Mme Lambard is also a fine autumnal Rose. General Schablikine and Comtesse Festetics Hamilton have a great future, for they grow and blossom most freely, and are always admired in the mass. Ma Tulipe will also please a great many, although nearly single. Its fragrant parent, Princess Bonnie, is one of the best things the American growers have ever sent us. Lady Battersea has a most lovely bud, the expanded flowers, being not unlike those of Killarney, only rather deeper in color. A refined, shapely, and brilliant Rose, too, is Liberty, and, above all, it possesses a powerful fragrance. Already this Rose seems to have recovered from excessive propagation, and I feel sure it will come to the front as one of our best dark colored autumnals. What a fine contrast would be the charming White Lady, splendid always in autumn. The La France race and, I might say, the Caroline Testout race, are well known as our best large-flowered autumnals, and the old and still unbeaten Souvenir de la Malmaison, with its sulphur-white sport, Kronprinzessin Victoria, give us of their beauty just now as they never do in the summer.

I could speak of the delightful Chinas, Queen Mab, Eugene Resal, and the rest, also some Polyanthas and others, but I have already indicated quite a number that the grower may with every confidence plant largsly if his object be a brilliant mass of blossoms during the autumn days.

ROSE BEAUTY OF WALTHAM.

It says much for an old favorite like Beauty of Waltham that in this, its fortieth year, the variety is found in the winning seventy-two that gained the champion trophy at the Temple Show. It is a very reliable Rose. It blossoms freely, and one may always depend upon a good flower, even if rather under-sized. Beauty of Waltham is a good autumnal for a Hybrid Perpetual. Unfortunately this group, collectively, does not rank as good autumnals when compared to the splendid Hybrid Teas, so that all that are above the average in this respect are most welcome. The color is bright cherry-red, passing to rosy-carmine, and the fragrance is very sweet. The petals are somewhat imbricated, the centres characteristically folded over each other. This trait in hot weather preserves the flower, but it undoubtedly accounts for the paucity of seedlings from the variety. If taken in hand by the hybridist a valuable hardy type would be produced. It is really remarkable how the Hybrid Perpetuals lend themselves to crossing, and I wonder there is not more of it done, instead of so many raisers following each other in the track of Hybrid Teas. We see in the variety Ben Cant how the fine bold petals of Suzanne Marie Rodocanachi are given to a flower of the color and form of Victor Hugo, the two kinds named being the parents of this coming Rose. Beauty of Waltham is a first-rate kind to grow as a standard, either outdoors or as a pot plant for the rose-house. It is also good in bush form, but the seedling Brier is the best stock for it, as this continues to grow in autumn when the Manetti is practically at rest.

ROSE BEAUTY OF WALTHAM.

DARK HYBRID PERPETUAL ROSES.

A pessimistic grower said to me a few years ago that the Hybrid Perpetuals had had their day. My reply was a decided negative, for, much as I love the exquisite Teas and Hybrid Teas, I could not forget the superb colors, the bold, thick-petalled blossoms, and, above all, the powerful fragrance of the majority of the dark Hybrid Perpetuals. The illustration of Ulrich Brunner is one of the most beautiful Roses I have ever seen, and portrays that fine variety to the life. It is one of the best light red Roses grown. I think if I could only grow one red Rose it would be Ulrich Brunner. There are Roses more perfect in color, but I know of none so good in growth or more useful in the garden. Alfred Colomb is another medium red of first-class quality, one of the best for autumn blooming, of perfect high-centred form, good in growth, and very fragrant. Marie Baumann much resembles the last-named, but is, perhaps, on maiden plants the better flower. As a cut-back, however, it is not nearly so good. In a small collection both are not wanted, and I prefer Alfred Colomb. Beauty of Waltham is a good light red. Of rich crimsons, Alfred K. Williams takes premier position as a show bloom, but I should prefer General Jacqueminot for general culture. Taken all round, there is even now no better red Rose. On the Manetti this grand old kind is not happy, but on own roots it is a great success. Comte de Raimbaud is a crimson Rose worthy of more extended culture, it is so very reliable and a good grower. So also is Fisher Holmes, one of the best early and late, its handsome blossoms are of a very glowing color, and if not disbudded will give a quantity of lovely buttonhole flowers. Although not identical, if Fisher Holmes be grown I do not consider one requires Duke of Wellington excepting for show—then there is ample room for both. Dr. Andry, Duke of Edinburgh, Duchess of Bedford, Duke of Albany, Eclair, and Earl of Pembroke are thoroughly good red Roses, and quite distinct from each other.

Of the rich velvety crimson Roses, a type of color so much sought after, Charles Lefebvre is certainly the best. It is a fine, bold, semi-imbricated flower, the growths strong and sturdy, foliage handsome, and it is a kind that pays for liberal feeding and free disbudding. Another grand variety that everyone may succeed with is Eugene Furst. The petals are deep, not very smooth edged, but color and also growth are so good that there is no dwindling of the plants as is too frequent among dark Roses. Triomphe de Caen or Prince Arthur is a Rose everyone should grow. It is of darker color than General Jacqueminot, but no doubt is a seedling from this, as it possesses all its good points. Maurice Bernardin, which passes under various aliases, such as Exposition de Brie, Ferdinand de Lesseps, and Sir G. Wolseley, is a variety of much merit, distinct from other crimsons, always grows well, and is an all-round good Rose. Horace Vernet and Louis Van Houtte would claim a place in the best six crimson Roses did they but possess a better constitution. If these are grown, a point worth remembering is to bud a few each year on the Brier. The resulting blossoms are worth this and even greater trouble and expense, for two more lovely Roses we do not possess. Earl of Dufferin, Duke of Fife, and Duke of Connaught are also of more than ordinary merit, the last a lovely buttonhole kind. Victor Hugo I have left until last—not because it is least. In our large collection no Rose claims more attention than Victor Hugo, principally owing to its gorgeous color. It is not a strong grower, but it is a better cut-back than Xavier Olibo. Ben Cant will become without a doubt one of our leading dark crimsons, and perhaps supersede Victor Hugo, for it is certainly a better grower.

With the exception of Duke of Edin-

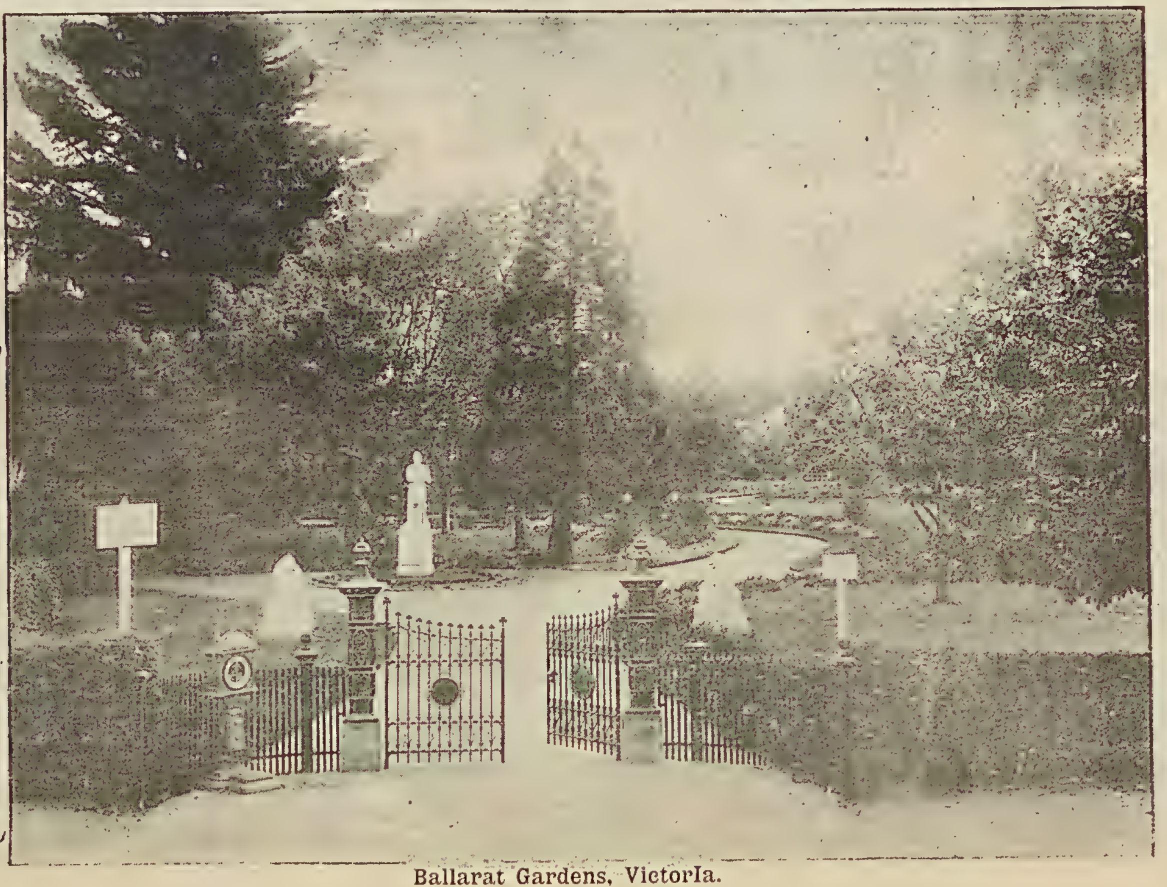
ROSE ULRICH BRUNNER.

The Art of Budding Roses.

Government House, Sydney.

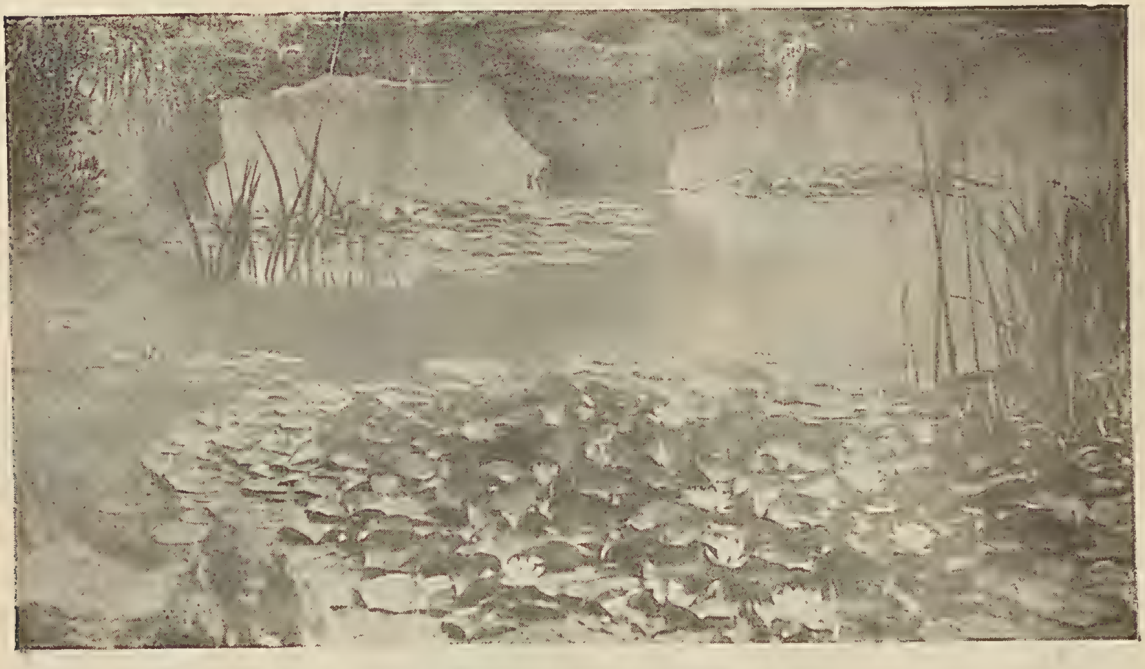
The Briers. Residence of Mr. H. J. Cowell, Medindie, South Australia.

Government House, Adelaide.

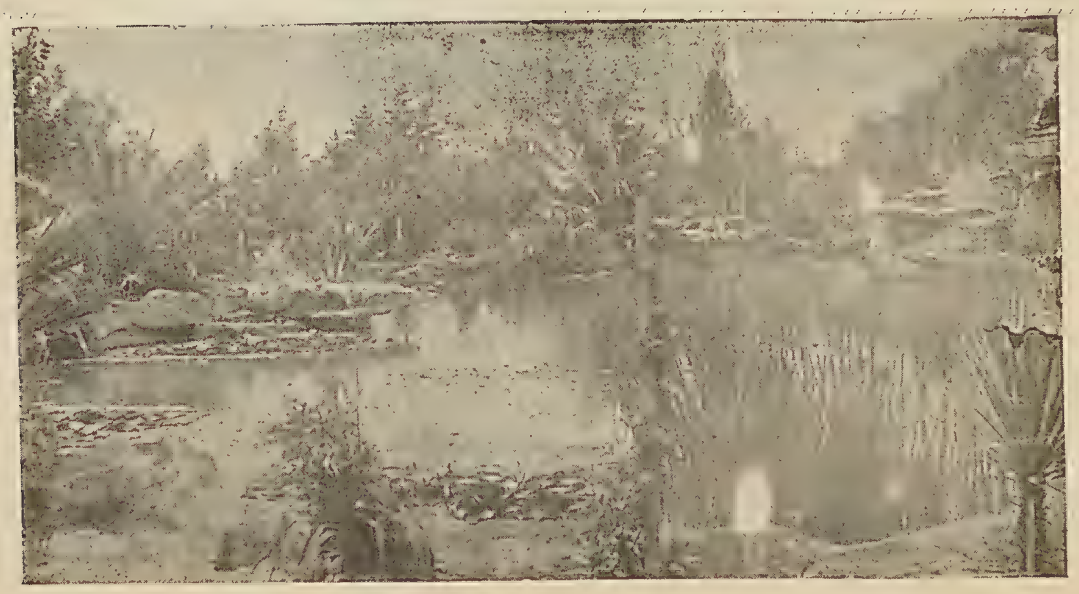


Ballarat Gardens, Victoria.

WATER SCENES.



Malvern Gardens, Victoria.



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burgh, all the kinds named above are very fragrant, and worthy of culture on that score alone. Where space is available I would recommend that they be grown, for if some approach each other rather closely in color, they each have their own special season, and by growing all some good dark H.P. Roses are secured each year.

THE ROYAL AGRICULTURAL AND HORTICULTURAL SHOW AT ADELAIDE.

March is the month when the inside section of this show claims more attention than the exhibits outside. The unusual mildness of the summer lent itself admirably to the producers, and enabled them to fix a record for the exhibits. In all the divisions of fruit, vegetables, and flowers nothing so excellent had ever before been staged in Adelaide, and we are willing to venture the opinion that not a better collection would be found in the world. That sounds a little boastful, but it is not given in a spirit of boastfulness. The remark is intended to represent the exhibition of produce as a whole, and thereby indicate what we believe to be a fact that no other country is more suitable than South Australia for growing an extensive variety of fruits, flowers, and vegetables. The apples and grapes particularly were superb, the varieties indicating that all the commercial products can be grown in our hills districts for profit, and why the South Australian growers should allow the Tasmanians to lead the way in export trade is a decided reflection upon the producers. It is true that the ravages of the codlin moth frightened the growers into an overweening timidity, but now that a remedy has been found it is hoped that the orchards will come again into profit.

Dahlias at the Adelaide Show. Kindly lent by the Proprietors of the "Adelaide Observer."

The pictures of apples and grapes tabled at the show serve to indicate the immense variety and the quality of the fruit exhibited. Of the apples the Jonathan seemed to be the greatest favorite, and some fine specimens were staged. Cleopatras were also a good exhibit. In the grapes it was difficult to pick out a variety better than its neighbor, but we noticed some magnificent berries on the new variety named Centennial. But they evidently require more cultivation to bring them to a more even sample. The orchardists and vinegrowers are to be commended for their care in naming the varieties. This is a distinct advantage, but we cannot say the same about the vegetable growers. In this division of exhibits we think the Society should exercise their authority to make the exhibitors name their specimens. The Society is much to blame for this. To label an exhibit as potatoes, round, or onions, not red, is a manifest absurdity in the matter of classification. But even if the Society cannot hit upon a better classification than that, they might insist upon the exhibitor naming the variety more explicitly. The show is worth nothing if it is not to be educative. It is surprising, too, that the exhibitors, being for the most part professional gardeners looking for orders, do not name their varieties from a business point of view.

Visitors to the show who are attracted by the exhibits of vegetables are generally those who grow a few of their own, and it would be a distinct advantage to both them and the growers if they could order by name those varieties that strike their fancy. What is true of potatoes and onions is equally true of all other vegetables.

FLOWERS.

It was expected that the show of flowers this year would surpass any other March show, and visitors were not disappointed. The flowers were good, the entries numerous, and the competition keen. We noted that a few new names amongst the exhibitors are asserting themselves in competitions with those of the old professional names that have graced the tables for many years. The stereotyped names of Newman, Sewell, Giles, and Halliday are still repeated time and again right through the prize-list, and the total of awards that these gentlemen have gained would fill a very long array of figures. The Roses were good, but a little more competition would have improved the display. There are many varieties of autumn bloomers well worth cultivating, and it is a little surprising that the Rose growers do not come out at this show. Zinnias are essentially summer flowers, but the season had not given them sufficient sun to develop them as they should have been. But when one flower fails in this respect, another takes advantage of the mildness of the season, and so we found Pelargoniums looking their very best, and vying with them were Verbenas, which we are pleased to note as coming a little more into favor, and for this we think gardeners will find themselves indebted to Mr. McInnes, whose specialising tabled a fine show of first prize blooms. Another old favorite we were pleased to see well represented was Phlox. Few flowers surpass Phlox for daintiness, brightness, and beauty of tinting when tastefully grouped in beds. The spikes of Gladiolus were good, but the individual blooms might have been improved upon for size and distinctive coloring. We find it impossible to particularise, but cannot pass without a word of commendation and welcome to the staging of a fine lot of Begonias by Mr. W. L. Hartland, from Victoria. We hope the introduction of Mr. Hartland is only the beginning of more extensive competition from our neighbours in other classes. Mr. Hartland's display was certainly very fine, and well deserved the first awards. The Newman firm and Mr. Giles are difficult exhibitors to beat, and we think, without saying positively, that this is the first occasion on which they have been beaten in such an all round fashion. We believe, however, that they can do better, and the competition may serve a good purpose when these gentlemen meet again, as we hope they will. There is plenty of room for popularising the cultivation of Begonias, and such competition may have the desired effect.

The showiest cut blooms in the exhibition were the Dahlias. We are pleased to be able to reproduce a part of the show Dahlia exhibit, and offer a sketchy review of the history of this favorite flower.

Dahlias.

The original flower was named after the Swedish botanist, Dahl, in 1791. The show varieties number some hundreds, but in point of popularity what is now known as the Cactus varieties rival them for decorative purposes. The original Cactus form was introduced from Mexico in 1879, but has entirely given way to the beautiful forms that have been grown from it.

The following will be helpful to those not conversant with the characteristics of each section:—

Show Dahlia is a large double self-colored flower, or else the base of the florets is of a light color edged with a darker shade: in this latter case the flower is called "edged."

Fancy Dahlia is similar to the foregoing as regards size and form, but has two or more colors; either the ground color of the floret is splashed or striped with other colors, or the florets have a darker base than the edge, in which case the flower is called "tipped."

Pompon or Bouquet resembles the show and fancy type in shape; its chief attraction is the diminutive size of its flowers and free blooming properties. This class is invaluable for a constant supply of cut flowers.

Cactus.—A true Cactus Dahlia should have long, narrow, pointed, or fluted florets, which radiate from the centre. A variety showing flat petal is no longer tolerated. In the best forms the edges of the florets are folded back until they meet throughout their whole length, ending either in a point or a fluted termination. This is, without doubt, the most effective autumn flower for decorative purposes, and at present the most popular section of all.

CaCTUS DAHLIAS.

Decorative Dahlias usually resemble in some measure the Cactus varieties, but which, either by the flatness of the florets or a failure in some other manner to come up to the standard of a true "Cactus" variety, are designated "Decorative." They are not much in favor just now.

Single consists of but one row of flat florets evenly arranged.

Single Cactus is similar to the ordinary Single, but the florets, instead of being flat and even, are curved and curled.

HYBRIDS OF BEGONIA SOCOTRANA.

The introduction of Begonia socotrana in 1880 was a particularly notable event, firstly, from the fact that the discovery of Begonia on the Island of Socotra was totally unexpected; next, the species so discovered was in every way distinct from any other in cultivation; and thirdly, viewed from present day knowledge, is the circumstance that it has proved to be the originator of a new race of Begonias, some of which rival the members of the tuberous-rooted section in their showy blossoms, yet they flower during the dull days of winter, at which period the Andean hybrids are quite dormant. To Messrs. Veitch belongs the honor of raising the first hybrid from Begonia socotrana, viz., the variety John Heal, which flowered in 1885 and was then awarded a first-class certificate by the Royal Horticultural Society. Since then Messrs. Veitch have devoted a good deal of attention to this section of Begonias, and some of the fruits of their labors were well shown at the Drill Hall meetings in November and December last, when they exhibited splendid groups, consisting of varieties of this charming section. Not only are the forms now in cultivation very beautiful, but there are great possibilities for the future, and we may some day see as wide a range of color and form as now exists among the varieties of the tuberous Begonia. In one respect, however, these hybrids of B. socotrana differ greatly from the summer-flowering group, and that is in their sterility, hence it is necessary to increase them by cuttings. These hybrids of B. socotrana have their resting period, and that is after the flowering season is past. At that time they must be kept moderately dry, but not to the same extent as the members of the tuberous-rooted section, as these socotrana hybrids have more of a thickened root-stock than a tuber. Early in the summer they should be shaken out of the old soil and repotted. Some half a dozen of these varieties are obtainable, and there are some newer kinds, of which sufficient stock has not yet been obtained to offer them for sale.

No mention of hybrids of Begonia socotrana would be complete without M. Lemoine's Gloire de Lorraine, which is undoubtedly the most popular winter-flowering Begonia of the present day. Concerning its appearance and cultural requirements much has been written, but its early history is not so well known. It was raised by M. Lemoine at his nursery at Nancy in 1891, the parents being B. socotrana and B. Dregei. Distributed in the spring of 1893, it rapidly became popular, in this country at least; indeed, it made much more headway in the land of its adoption than of its birth. The white sport Caledonia bids fair to be extensively grown. Prior to the distribution of the variety Gloire de Lorraine, M. Lemoine put into commerce two other hybrids of B. socotrana, said to be obtained between that species and another Begonia, probably B. Roezli. The varieties were Triomphe de Nancy and Triomphe de Lorraine, but they are rarely seen nowadays.
—W. T.

THE JAPAN EULALIAS.

The Fan Grasses or Eulalias of Japan are now, I believe, placed in the genus Miscanthus, but it will probably be some time before the latter name becomes current, and so we may stick to Eulalia, for the present at least. I have long grown these beautiful grasses, both green, striped, lined and barred, but never saw their fan-like plumes so profusely produced or so fully developed as they are this season. They will always be valued for their freshness and grace in the garden, but the inflorescence is an added gain, as each grassy stem, 5 ft. to 7 ft. in height, is topped by a feathery fan of dark reddish purple, from which the golden anthers dangle and shimmer in the hot sunshine in a very pretty way. Later on the spikes become a mass of silvery fluff, and remain bright and beautiful all the winter unless they are cut for decoration.
—F. W. Burbidge.

SCIENCE NOTES.

The student is inclined to ask why the modified system of Jussien, now generally used, should be called "natural." An answer is that it is less "artificial" than that of Linnaeus. Under the latter system the number of stamens and pistils is the first guide to the classification of plants. This is so simple that even now it is not unfrequently used, the natural system being taken up later on just as Linnaeus himself looked forward to. But this mechanical method of sorting is little better than indexing a library by the color of the binding of the books, or by their size. In both cases the artificial system brings together individuals absolutely diverse. A natural system seeks to establish affinities amongst the things grouped. It is evident that with so complex a structure as a plant several parts might have been chosen as starting points; for example, the leaves. But that part which has the most permanence is the most suitable, and the organs of reproduction have been found to have the highest claim. The natural system, then, takes into primary account the stamens and pistils, but also their arrangement, and the form and arrangement of the including petals and sepals; the seed, too, with its enclosure and its internal structure, is also brought into account. As secondary characteristics the leaves, and, in fact, every other part of the plant, are duly considered. Thus in the large group of Acacias the flowers are often so similar that the leaves are important guides. The natural system claims to establish affinities, but that by no means applies to size or even general appearance. Thus the apple, Rose, and strawberry belong to the same order, but for any similarity of appearance they must also belong to the same tribe or sub-order. Nor must the student be discouraged if he finds "exceptions" to the general descriptions of the orders; Nature will not be bound by rigid definitions. He will even find differences of opinion as to which order certain plants best fit in, just as certain animals are either goat-like sheep or sheep-like goats. If, however, he is wise he will not at first trouble himself about exceptional cases, but will seek to acquire a knowledge of the broad characteristics of each order, and its differences from and agreements with, adjoining orders. He can then for himself test the claims of the "natural" system: the Labiates will do well for a commencement.

Apples at the Adelaide Show. Kindly lent by the Proprietors of the "Adelaide Observer."

The Orchard.

OPERATIONS FOR APRIL.

By W. J. Allen.

In case the grower intends giving his orchard two ploughings, the first should be completed at as early a date as possible. Outside of this, the land should have as complete a rest as possible until the winter ploughing, when all weeds which may have grown will be turned under while still green, and before they seed. It is now rather late to sow seeds for green crops, as there are very few crops which will make much of a growth between now and August, which month in most instances is quite late enough to do the winter ploughing.

Planting of citrus trees may be continued this month. When autumn planting is practised, care should be taken in handling such trees not to expose the roots to either wind or sun for any time.

Codlin moth bandages must still be kept on the trees, as, even after all the fruit is removed, an occasional grub finds its way to the bandage.

Trees badly disfigured by the ravages of woolly aphis, are a source of danger in the orchard, as are also rough-barked varieties of either apples or pears, as in the ruptures caused by the woolly aphis will be found numerous grubs, as also underneath the rough bark, and it is a question whether it would not pay to cut all trees well back or down, which are in very bad condition, as I feel sure it will be impossible to eradicate the moth while the trees offer such excellent harbor for the grubs. It is very noticeable when removing bandages that those trees which are badly disfigured with woolly aphis are rarely found to have many moths under the bandages, but on a close inspection of the knobs grubs may be found in all of them, and where this is the case, there is but slight hope of ridding the orchards or districts of this pest.

All dormant bud ties may be removed this month.

The stones and pits of the different fruits required for stock-raising may be planted this month.

Trees required for refills or for planting new orchards should be secured as early as possible, and all land which is to be planted should be prepared without delay.

In purchasing trees deal with nurserymen who are known to have a good reputation, and who are raising their own trees, as it is to their interest to supply nothing but good stocks, if they hope to do any future business. There is nothing more discouraging than to find after growing trees for three or four years that the varieties are worthless.

Growers in different localities often find that they have a variety which is doing exceptionally well in their particular district. In this case, if they are not sure of the name, and cannot get it properly named, I would recommend that they should send their wood to a nurseryman, and have him work as many trees for them as they require. In this way they are sure to get exactly what they require, and I feel sure there is not a nurseryman but what would undertake to carry out such a contract carefully.

Two or three good varieties are much better than two dozen, and one case of good fruit is generally worth as much as three or four cases of poor fruit; therefore, it is well to exercise great care to choose only the best, if it is hoped to make fruitgrowing pay.—"Agricultural Gazette of N.S.W."

Grapes at the Adelaide Show. Kindly lent by the Proprietors of the "Adelaide Observer."

Vegetable Garden.

OPERATIONS FOR APRIL.

By W. S. Campbell.

At this time of year the vegetables known as tender vegetables, such as the kidney or French beans, and tomatoes, are practically over, but if anyone should have growing any particularly good varieties of tomatoes, it would be worth while making an endeavour to strike cuttings, and if successful thus saving the varieties, and having plants on hand to plant out very early in the spring, with a better chance of an early crop than could be obtained from seedlings raised in the spring. It may be rather difficult to preserve these rooted cuttings during the winter months, for they may very easily be destroyed by frosts. However, they may be protected at night by boxes, glass frames with coverings over them of straw, of bags, or anything handy that will keep out heavy frosts. As the rooted cuttings may be planted quite close together, it is possible to keep quite a number in a very small space of ground, or in a box, or one or two pots even, which may be taken into an outhouse at night.

Pumpkins should be ripening well by this month, and can be stored for the winter, taking the greatest care not to bruise any when storing. Every farmer, or for that matter anyone else who has a sufficiently large garden, should raise sufficient table pumpkins to last through the winter months. The best variety of seed possible should be obtained, and no other kinds should be sown in the same garden; but as the time for sowing seed is not until the spring, further particulars will be postponed for the present.

Asparagus.—As this vegetable should be planted early in the spring, just before the shoots start into growth, some ground should be prepared in good time. This should be trenched 2 feet deep, and a heavy dressing of farmyard manure should be mixed up with the soil when the trenching is proceeding. Some good soils may not need manure unless they are of a heavy, sticky clay nature. Then, no matter how rich they may be, it would be advisable to apply the farmyard manure or a very heavy dressing of lime, say, at the rate of 2 tons to the acre. This will quite alter the character of the soil, and cause it to become friable and easy to work. When the ground is prepared, allow it to remain in a rough condition until the time for planting is at hand, when the surface can be dug and trenches prepared for the asparagus.

Beans, Broad.—The month of April is very suitable for the sowing of broad beans. Although heavy soil is the most suitable for this vegetable, it can be grown almost anywhere, and by the application of good manure it should succeed satisfactorily. Before applying the farmyard manure a good dressing of common lime or of gypsum or sulphate of lime will improve not only the growth of the beans but their quality. Sow the seed in rows about 3 to 4 feet apart, an inch and a-half or 2 inches deep, and set the seeds about 4 inches apart in the rows.

Beans, Kidney or French.—It will only be safe to sow in places where there is not likely to be any frosts.

Beet, Red and Silver.—A little seed may be sown with the chance of a crop. Thin out any advancing plants which are growing too close together.

Borecole or Kale.—This vegetable, a member of the cabbage family, succeeds best in cool climates, where it is worth growing. It may be treated as ordinary cabbage, and a little seed may be sown during the month.

Brussels Sprouts.—This is another sort of cabbage, and an excellent one, too, which should be grown extensively in the cool climates. Like all the members of the cabbage tribe, it will need rich soil, plenty of moisture, and good cultivation during the whole time of its growth. Sow a little seed, and if any plants have been raised, and are suitable, plant them out about 2 feet apart each way, a few at a time, during the month.

Cabbage.—Seed may be sown extensively, not all at one time, but occasionally during the month, and plant out any young cabbages which may be on hand; but use abundance of good manure, for the cabbage is a good feeder and needs a considerable amount of nourishment. Sow seed of the red variety for pickling. If all that are planted are not required for pickling they can be made use of as the ordinary cabbage.

Cauliflower.—Sow a little seed occasionally during the month in order to keep a sufficiency of plants ready for planting when required. In order to grow the best of either cauliflower or cabbages for planting out, the seedlings should be pricked out a few inches apart, as soon as they are large enough to move from the seed bed. They will then become much more robust and satisfactory than if allowed to remain crowded up in a seed bed. Always endeavor to move any of the plants without breaking their roots. The cauliflower needs very rich soil in order that it may grow to the perfection that it should; and it should have no check during its growth.

Carrot.—Sow seed during the month from time to time, making the drills about a foot apart. Sow the seed not more than an inch deep. Avoid the use of fresh manure, and, if possible, use ground that had been well manured for a crop which has been gathered.

Celery.—Sow a little seed, and plant out any seedlings which are on hand and are well grown. Earth up plants which have attained almost the full growth. The soil for celery should be made quite rich, and the use of abundance of water is necessary to produce good tender celery.

Endive.—Sow a little seed of this useful substitute for lettuce. If seedlings are on hand, plant out a few occasionally during the month.

Leeks.—This is a good time to sow seed and raise leeks for planting out in trenches or on the flat, if that system be preferred. When planted in trenches water and liquid manure can be applied more easily than when they are planted on an ordinary bed. The use of abundance of water and of liquid manure is advisable during their growth.

Lettuce.—Sow seed from time to time in order to keep up a sufficient stock of plants. This is a good time to plant and sow lettuce seed, and the seedlings may be transplanted, without much chance of the plants running to seed as they are likely to do during the summer months.

Onion.—Sow freely of onion seed during the month, for April, if the soil is in favorable condition, is a good time for sowing extensively. Use a good deal of rich farmyard manure, dig the soil well, drain well, and make the surface as fine and even as possible. Sow in drills about 1 foot apart, and cover the seed but lightly with fine soil. When the plants come up, it will be necessary to hand weed them, and particular care should be taken to keep them free from weeds. If small pickling onions are required, sow some seed very thickly broadcast.

Parsley.—Sow a little seed.

Parnsip.—Sow a little seed occasionally. The soil should be trenched for this vegetable, as its roots descend deep into the ground. It is better not to apply manure, but to use land that has been well manured for some other vegetable.

Peas.—If sown now a good return may be expected if occasional showers of rain fall during the growth of the plants. Sow in drills from 3 to 5 or 6 feet apart, according to height of variety. The dwarf kinds may be sown closer together than this. Use plenty of farmyard manure, and if lime can be obtained easily apply a dressing on the surface of the soil, and if raked in lightly it will gradually sink into the soil quite deep enough.

Radish.—Sow a little seed in drills from time to time during the month, and make use of the radishes before they grow large.

Sea-kale.—Preparations can be made for planting roots of this somewhat uncommon vegetable, the only difficulty with which is the blanching of its young shoots in the spring. The botanical name of the plant is Crambe maritima. It is a distint relative of the cabbage, but belongs to a different genus. From very ancient times it was collected about the sea coast in Great Britain and Europe, and the large bluish-green colored leaves were boiled and used as cabbage is used; but in its native state it is coarse and by no means very palatable. Within comparatively recent times it was found to be a most delicious vegetable when its young leaves were blanched, and at the present day is used to a considerable extent in England, but not so much as it deserves to be in other countries. The old writer on botanical subjects—Gerard—refers to this plant in his "Herbal" thus:—"The sea colewort groweth naturally upon the bayche and brimmes of the sea, where there is no earth to be seene; but sand and rowling pebble stones." This vegetable is supposed to be the Halmyridia referred to by Pliny, who says it grows only on the sea-coast, and that provision is made of them to serve in long voyages at sea, for as soon as they are cut up they are put into barrels where oil has lately been kept, and then stopped up close that no air can come to them. As this plant is a perennial, like asparagus or rhubarb, the ground in which it is to be planted should be trenched, well manured, and carefully drained. Either seedling plants, roots, or portions of roots may be planted in rows about 4 feet apart, the plants to stand about 18 inches or 2 feet apart in the rows. As much growth as possible of large leaves should be encouraged after the plants start into growth, whereby the buds which form in the axils of the leaves may be induced to grow large, for from these buds the leaves will come next season. When the leaves drop off in the winter, light soil may be heaped up for a foot or 18 inches over the crown of each plant; or, in the spring, large pots (some are manufactured especially for the purpose) may be placed over the crowns. As the object is to blanch the young shoots as they grow, any sort of light material may be used with a little ingenuity to effect the object. The use of light sandy soil is perhaps the easiest, but much care must be taken in removing it from the tender and very brittle shoots when they are ready for cutting. After a trial or two with sea-kale anyone accustomed to gardening should be able to grow good sea-kale and blanch it satisfactorily. A failure or two should not dishearten a beginner.

Spinach.—Manure some ground well, and sow a little seed occasionally during the month.

Shallots.—Plant a few bulbs about 1 foot apart each way.

Herbs.—Sow seed of any kinds that may be required, or plant if any young herbs have been raised from seed.—"Agricultural Gazette of N.S.W."

SOUTH AUSTRALIAN GRASSES.

By J. G. O. Tepper, F.L.S., F.S.Sc., &c.

(Continued.)

By J. G. O. Tepper, F.L.S., F.S.Sc., &c.

Stipa semibarbata, R. Brown, occurs in all the Australian colonies and Tasmania. It is a rather tall coarse grass up to 4 ft. high, and forms moderate tufts, usually under shelter of shrubs in mallee scrub regions and similarly dry localities. The stems are rather stiff; the leaves from a few inches to 2 ft. long, narrow, and usually rolled inward (involute) or almost awl-shaped. The stem, sheaths, and leaves of the lower portion, or the plant altogether, are densely velvet-hairy. The head [illegible] a panicle, bearing short erect bra[illegible] of several spikelets, and attains a le[illegible] of 8 to 12 in. The other glumes ([illegible] of chaff) are up to three-quarters of [illegible] long, and end in fine long points. T[illegible]ing glumes are about one-third this [illegible], and silk-hairy. The awn is from 2 [illegible] long, and has the long hairs fixed a[illegible] side in a line, which, when the frui[illegible], follows the spiral and continues e[illegible] yond the bend. The whole plant ha[illegible] a pale, sometimes a yellowish-gr[illegible] and is one of those which spring up [illegible] luxuriance after a bush fire, cove[illegible] richer parts of the land with a der[illegible] of grass from 2 to 4 ft. high when i[illegible] or fruit, but only for a season or [illegible] sorbing quickly the nutrimentary [illegible] matter, resulting from the burnin[illegible] woody portion of the scrub, but [illegible] dwindling down in quantity if th[illegible] tion be repeated too frequently. [illegible] case the ground becomes gradual[illegible] and more sterile, Amphipogon stri[illegible] other hard grasses in scattered sm[illegible] replacing the above and its ass[illegible]

Stipa scabra and aristiglumis, &c., to a great extent.

Stipa pubescens, R. Br., is another widely distributed species, though scarcely reaching so far south. It is of about the same size as the preceding, but not so hairy, notwithstanding the name, which refers to the hairy nodes. The leaves are convolute, or rolled backwards spirally, and narrow. The panicle is loose or very loose, the glumes smaller, seldom pointed, but more usually blunt or three-toothed, and the awn hairy only at the lower end.

Stipa aristiglumis, F. v. M., has much the habit of the last, but is commoner, prospering in rich and poor soils. Its stems and leaves are glabrous or very sparsely hairy, or dark-green color; the latter are narrow and up to 2 ft. long in rich soil, with the basal part flat. The panicle is open, 6 to 12 in. long, and plume-like. The glumes end often in one or three fine points, to which character the name refers, and are comparatively small; the awns are not much bearded, nor hairy. The flowering season is in September, and the spear-like seeds very numerous. Under cultivation it forms large tufts of long moderately broad leaves, permitting frequent cutting, the tufts increasing in size from year to year, while it resists the drought splendidly. It is a much better fodder grass than Stipa semibarbata, and frequently associated with it. This species is absent from Western Australia and Tasmania.

Stipa scabra, Lindley, is one of the smaller and most common species in the districts about Adelaide, forming the principal pasture grass with Danthonia and Festuca. The stalks are very slender, from 10 to 20 in. high, and covered thinly with very short hairs; the leaves are almost or quite threadlike, soft, and from 3 to 10 in. long. The panicle or head is very loose, with very slender branches, and mostly only a few inches in length, except on rich soil. The outer glumes are often of a deep brown or purplish, and taper to long points. The awn is long and fine, and bearded in the lower half. The flowering season is September, and the seeds ripen and fall in October. It is absent from Tasmania and North Australia, which latter, according to Baron F. v. Mueller's Census, has only one species of the genus, viz., St. elegantissima.

Dichelachne crinita, J. Hooker, occurs in the hill districts, as well as in the richer parts of the mallee scrublands, usually in solitary tufts in the shelter of low shrubs; the stems are not very stiff or rigid, and about 2 ft. high. The leaves are flat, rather narrow, and soft, the lower ones usually shorter than the upper ones, and are either smooth (glabrous) or finely velvet-hairy, according to the nature of the locality. The ear forms a spikelike dense panicle of numerous closely adpressed branches, in which the short spikelets are almost concealed by the fine awns. The latter are not nearly so much twisted or bent as those of Stipa, and only the point of the slender fruit is barbed with silvery hairlets. The flowering and fruiting season extends from November to January respectively. The species is distributed over all the Australian colonies and Tasmania.

Dichelachne sciurea, J. Hooker, the only other species, is absent from Western Australia, and smaller than the first. The leaves are mostly rather short, and quite hairless about the base, while the panicle is narrower and looser. It appears to be rarer than D. crinita.

Pentapogon Billardieri, R. Br., the only species of the genus, is a small grass with very narrow leaves, mostly without any hairlets, and is usually found among other grass, in more or less permanently moist localities, such as the neighborhood of springs. The stem or stalk is very slender, the ear nodding or erect, and from 2 to 6 inches long; it is formed of distant, flat, almost sessile spikelets, with short bent awns. The outer glumes are comparatively long, with a prominent keel; the inner flowering ones are seated upon a short hairy stalklet or stipes. It flowers and fruits about December, and is absent from Western Australia and Queensland. This species is not promiscuous compared with others, but a good fodder grass otherwise.

Echinapogon (Cinna) ovatus, Palisot, is a creeping grass, the decumbent stalks rooting at every joint. The leaves are rather broad and flat, 6 to 12 in. long, and though soft, roughened by short bristles, which are directed backwards along the back and the edges. The head-like ear is very dense, up to 2 in. long, and almost cylindrical. It is seated upon a stiff, leafless stalk, from 8 to 10 in. in length or more, with reversed short bristles, which prevent it from being drawn through the fingers. The small spikelets, with their awns, stand very close together, and nearly at right angles to the rhacis. The flowering glumes are surrounded by a tuft of hairs. The species is the only one of the genus, and occurs with us usually near water courses in moist, rich soil, though it can stand a good deal of dryness. Under cultivation on garden soil a single plant spreads quickly over a considerable space, but alone does not form a fine tuft, as it is rather straggling. When once established it is rather difficult to eradicate on account of the node-rooting stems, which easily break, leaving the rooted portion behind. It is a good succulent, and permanently green fodder grass, very suitable for moist pastures. The species is found over all Australia and Tasmania, except the northern tropical part and flowers and fruits from November to January. On its stalk a blackish rust occasionally occurs, which has not yet been observed in other grasses.

Amphipogon strictus, R. Br., inhabits the open sandy scrub lands and hillsides, and extends throughout all the colonies, except Northern Australia and Tasmania. Western Australia owns four other endemic species. It grows in small tufts from an underground stem; the leaves are usually erect, awl-shaped, stiff, and sharply pointed. With some varieties they are 6 inches to a foot in length! in others they reach only two to four, while in a third they are short, flat, and scarcely to be called stiff, at least when young. The upper leaves are always much shorter than the lower, except in age, when those of a variety in the dense scrubs of the rocky summits of the Mount Lofty Ranges attain a considerable length without even developing a fruiting stem when undisturbed. The latter, however, appears during the season after a bush fire, and in profusion. The young leaves of this variety are always flat, and more or less depressed. Another peculiarity of this grass, which always is found on the poorest soil, is that the growing point of the stems frequently swells into a rather thick head, the leaves surrounding it being much dilated and shortened. This singular spike-like head is not the ear, but a gall peculiar to the species, but what insect causes it is unknown to the writer. The flowering and fruiting stalk is tender and rigid, the spike ovate, almost cylindrical, and from three quarters of an inch to twice that length. The outer glumes are much longer than the inner ones, end in a long sharp point, and have their edges lined with long fine hairlets; the inner ones are quite hairy, and their upper half is split into three long, bristle-like points, which, when ripe, are much curved. The flat-leaved hill variety flowers in October, the rigid scrub plants in December. As a fodder plant the above is of little value when any other is to be had, except when young.

Pappophorum commune, F. v. M. (nigricans, R. Br.), extends over all Australia but not to Tasmania, and is a soft-leaved grass, sometimes quite velvet-hairy. The leaves are moderately narrow, or rather broad when young, and mostly over 6 in. long. The stem is erect, up to 18 in. or more high, and bears a very dense ear-like panicle from 1 to 3 in. in length which is sometimes almost densely cylindrical, and sometimes much more open or even loosely branched. The genus contains only two species, of which the above is distinguished by the outer glumes being only from one to two lines long and having from five to nine nervules, while the Central Australian species, P. avenaceum, Lindley, has them much longer, and each with eleven to twenty-one nervules (Bentham). Our species is usually found in moist localities, such as river flats, &c., and flowers in September or October. It appears to be of annual duration, and is good for fodder.

(To be continued.)

MUSICAL EDUCATION.

There are many country homes, and also homes in the suburbs where gardeners and their families greet an evening's recreation with music as a great boon. So it should be. The difficulty very often lies in the fact that while the piano or organ is there the musician is wanted. To supply this pleasure we are introducing from America a Chart of Musical Chords, arranged by Mr. Charles E. Pratt. By the use of these Chords, which any ordinary intelligent person can learn quickly without any previous knowledge of music, an accompaniment can be played to any song yet composed. In addition to the Chart the publishers supply a book of popular songs, containing 48 pages, all for the very modest price of 2s. 6d. and postage. On receipt of 2s. 6d. and postage 2d. we will send the chart and music to any address in the Commonwealth. An advertisement appears on page 15.

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Answers to Correspondents

"Mrs. Parkhouse."—The name of your lovely "moonlight creeper" is Ipomea grandiflora alba. We are glad to know that it does so well near the seabeach. It is a charming creeper.

"J. Christopher," Broken Hill.—Poinciana regia.

"Miss Stone," Finniss Street, N.A.—Ipomea Horsfalliae, one of the prettiest creepers for foliage, and the flowers of an unusual color.

"Rose."—Yes. Roses can be transplanted this month, and cuttings put in.

"Cottager."—Keep your cinnerarias in the pots till the plants cover them and then transplant, spacing out about a foot.

"Bulb."—Tulips should be set out in a shady spot, with fairly rich soil.

"Edging."—Renew and reform the edgings this month. Sweet Alyssum as bordering is very satisfactory. It will bloom from January to December.

"Mrs. Giddons."—Nothing nicer. Everybody likes Sweet Peas, and it is strange that more gardeners do not take a little trouble to set them up in designs.

"Pruning."—The general principle observed as to when to prune is after the plant has finished flowering.

The Flower Garden

OPERATIONS FOR MAY.

The extraordinary summer has given way to autumn, with its lovely tints of gold and copper. Now the cottager should be as busy as a bee with his little front garden and also the back area. Digging, trenching, remodelling, hoeing, raking, and manuring makes plenty of work this month. The dying glories of the summer blooms have now to be removed and the litter stowed away in the manure pit to make leaf mould, and if every barrow load of stuff is covered with scrapings the stuff to be taken out later on will do well for top dressing. The exhausted stuff from annuals and biennials and deciduous trees is thus returned again to enrich the exhausted soil. The manure pit is a great institution in any garden. Put down in some odd corner it is made the repository for all refuse, and having a place to put stuff away conveniently is always an inducement to keep the garden clean. Weeds are a great specialty at this time of year, and we are dealing with them in an article to themselves. Dahlias and Cannas have exhausted their beauties and may be cut down a little later on to facilitate removal, after which the ground should be turned up and left for a while. Deciduous trees and shrubs may be planted out this month, and care should be exercised in setting them in places where they may be allowed free growth without hiding those of humbler aspirations, but of brighter bloom. It is a common experience for gardeners to look at some favorite shrub and every time wish it had been put in somewhere else. A little forethought will prevent this provocation. The variegated evergreens give a good tint of coloring to the garden during the dull winter months, such as the golden leaved Oleanders, Abutillons, Eleagnus, Coprosma, Euonymous, Pittosporum, Deeringia, and for deciduous trees the Maples (English and Japanese), Pyrus, Berberis, Prunus pissardi, and the Rhuses. The Maples, however, will only do in the higher altitudes. We should soon see the bulbs putting up their heads, and all the Narcissus tribe will be creating the annual excitement amongst bulb lovers. Anemones, Ranunculi, Iris, Liliums, Gladioli, Ixias, Snowflakes, Lachenallias, Watsonias, Tulips, Babianas, Amaryllids all gather to make a list quite equal to the summer annuals. Although they will be now putting up their first leaves after an early planting, the bulbs may still be put in for later flowering. Perennial Phlox may be divided. We do not think we have seen Phlox to better advantage than this season. The Adelaide Botanic Gardens show was, and is now, simply lovely in Phlox.

A writer in "The Florists' Exchange" makes some capital suggestions upon laying out a garden.

The Prosperous Florist.—As in all other lines of trade, be it shoes, clothes, hardware, seeds, or groceries, the prosperous merchant is the wide-awake, progressive one, the one who leads his customers on by keeping the newest, most useful, and approved materials, and showing them in such an attractive way that the public see their utility at once and cannot help buying them. The dawdler will always get left. It is the same in the florist business.

Your Own Home.—First of all, let everything about your own home be as spic and span as possible. Let the fence next the street be in perfect repair and painted, and the gate properly hung. Let the path leading from the street into your yard be even, unbroken by rut or rain, and dry and fit to walk on at all times. This costs nothing, and it gives an air of thrift and neatness that at once inspires confidence.

If the bit of grass lawn in front of your house is a rich green carpet, free from weeds and smoothly mown, the people will want a lawn at their own homes just like yours, and buy their grass seed from you, and maybe have you lay down the lawns for them. Your lawn advertises your grass, be it good or bad.

Climbers.—Up the pillars of your front porch you may have Crimson Rambler Roses; enclosing the verandah screens of Japan Honeysuckle or Clematis paniculata, or Chinese Wistaria trained around under the eaves and up the gable, each in itself of perfect form and appropriate in place. Some folks come in who want climbers but don't know what they want, and don't know the name of any climber, but right here on your porch they see exactly what they need, and buy it.

As Seen from the Street.—Let your place have a mighty pretty, cosy, attractive appearance from the street. A naked place is always repugnant. Step out on to the street and look in and study the situation. Now you want to hide from the street everything that looks ugly and unkempt. You may need a long stretch of dwarf shrubs to hide the bare side walls of the greenhouse; a gentle kink in the road and some bushes there to shut out the sight of the dump pile at the far end; some little trees or strong shrubs to screen off the sight of your neighbor's cowyard at the back, and so on. Then study how to mold or accentuate its beauty. Don't crowd up everything in front; that's bad taste. Of course, you cannot afford to lay out your place as a pretentious landscape garden. Yours is a commercial place, and you have got to display your wares to the best advantage and in the least space consistent with good taste, further, in such a way as to require little expense in maintenance.

What to Plant.—In your front ground plant only such things as grow well and look well at all times; never plant anything of a rough, rubbishy, miffy, or undecided character. And I don't like to see ordinary annuals in such a garden; there is a place for all uncertainties and ephemeral things in the nursery rows. In the front yard, even of bedding plants, have enough of each kind to make a decided impression, even if you limit the kinds. As every place has an individuality of its own, no definite general plan can be given.

Some people buy tree peonies, and, not knowing anything about them, expect their plants to grow as big as an oak or an elm, and then swear like thunder when they find the "trees" are only little bushes, and declare they have been swindled. But if these folks had seen the "tree" peonies in growth and bloom in the sample ground before they bought them, there would be no apparent deception anywhere, no dissatisfaction, and no kick coming.

How to Plant.—For my own part I prefer a long curving undulating front line, even if the back be dead straight and up against the boundary fence. The trees and taller shrubs at back, the lesser shrubs in front of them, and hardy perennials along the front margin. But don't plant these with the slope of shingles on a roof, or the precision of cabbage plants in a truck garden. So arrange everything that all of the plants will have plenty of room for several years' development, and each specimen will appear perfect, open and free in its individuality.

To Cover all Seasons.—We should have shrubs in bloom or ornamental fruit the whole season round, and the same in the case of perennials.

Trees.—There is room for only small growing trees and such as bloom early in life, as the Japan pyruses, dogwood, kœlreuteria, white fringe, Betchel's crab, red bud, double-flowered cherries, hawthorns, and the like. One of each is enough, and by judicious pruning they can be kept in small bounds for years.

Shrubs.—In arranging these just one of a kind, or a group of a kind, may be planted, but always keep all of the plants of a genus together. For instance, group all of the Spiræas together, the same with Lilacs, Magnolias, Azaleas, &c., no matter what's their season of blooming. But they needn't be bunched together; they may be in and out with neighboring shrubs. When first planted the shrubs will be small and not need a quarter of the room necessary for them in later years, but you can plant doubly thick to begin with and thin out in a year or two. Or, pending the filling up closely of the space allotted to the shrubs, you can plant a few choice Cannas or Japan Lilies between the shrubs.

Hardy Perennials.—In this show border have only a clump or sample of a kind, just enough to show decidedly what sort of a plant it is, but I prefer a small clump. For instance, one plant of Adonis, or one Liatris, or one Speciosum Lily, or one Columbine would have an impoverished look all alone by itself; on the other hand, a dozen Adonis, a bunch of Liatris, a clump of Lilies, a group of Columbines, and so on would impress the glory and beauty of these gems on any tyro. Let all of these perennials be of a permanent, good-looking appearance, even when not in flower. Iris, Peonies, Spiræas, Evergreen Candytuft, Scabios, Pyrethrum, Pentstemon, Veronica, and Funkia illustrate my meaning. But there are several indispensable kinds that must find a place here that are bare or rubbishy part of the year, such as Bleeding Heart, Delphinium, and Doronicum. Let these clumps occur between shrubs, or be fronted with other free-growing plants, so that when they are cut down after blooming the plants in front of them will so fall around the empty space as to practically hide it.

A selection of plants for this show border should cover the whole year in the matter of flowers. We can begin with the double-flowered Hepaticas, Adonis, Siberian Saxifrage, Golden Alyssum, Moss Pink, White Rock Cress, Iris, and pass on through Columbines, Sea Thrift, Siberian and other Pæonies, Bellflowers, German Irises, Anthericum, Coreopsis, Gaillardia, the finer Speedwells, Pyrethrum, Newman's Rudbeckia, Kœmpfer's Irises, Delphiniums, Lilies, Yucca, Phloxes, Funkias, Scabios, low-growing Helianthus, Monkshood, Japan Anemone, Physostegia, Pink Sedum, Tritomas, Tricyrtis, and many more.

In this border I would not have plants of a fast spreading growth, as Pearl achillea, Coronilla varia, or Lysimachia clethroides; or plants that would have to be staked to look well, as Clematis recta; or plants that would become a nuisance from self-sown seedlings, as Heliopsis Pitcheri or spider-worts; or plants of coarse appearance, as Symphitum or Cephalaria, or common back-yard plants, as Tawny Day, Lily, and Bocconia. There is a place for every one of these out in your regular nursery patch.

Extra Blossoms.—And as you introduce a few Cannas and Lilies between the shrubs to maintain and prolong the brightness and floral beauty of the border, you can do the same among the perennials by planting clumps of bulbs here and there where they will do the most good and be the most appropriate. For instance, groups of Ismene, Tigridias, Tuberoses, Lilies, Tuberous Begonias, or even Gladiolus. Never mind the foreign effect these auxiliaries may have. And there isn't an amateur in the country who cannot grow these bulbous plants just as well as you or I can. Amateurs crave to know these things, and they will buy the bulbs and be glad to get them and plant them if you'll only show them what they are good for. In one minute's glance at a border of this sort there is more indelible information to an amateur than you could give him in an hour's talk, or an essay in print.

And it is just as sure as preaching that the townspeople will go to the wideawake, progressive florist where they can see something and learn something as well as buy something, rather than be bothered with the florist who dawdles along in the same old rut that his grandfather travelled in, or whose establishment presents an ill-kempt, commonplace effect. Then, boys, let us get up and keep up.

Evergreens.—If there is one class of plants more than another that looks well as individual specimens it is Evergreens. Get the bluest of blue Spruces, the bluest of blue Atlantic Cedars, the most perfectly shaped Nordman's Fir, the prettiest Japan Hemlock, the various handsome forms of Arbor vitæ, Yew, Juniper, Retinispora, Box, or anything else that is real good and quite hardy. Don't have a plant there, no matter how pretty it may be, that you cannot vouch for.

Don't plant any Evergreen in your patch that is of imperfect form—naked at base, lopsided, deficient in leader or otherwise defective, no matter how rare it may be. Remember, as the strength of a chain is determined by its weakest link, the scraggy or decrepit plant in your show bed is the gauge for the public to measure. And, for mercy sake, don't prune up your evergreen. The greatest beauty of an evergreen is a full, broad, symmetrical base flat on the ground.

It would be inconsistent to expect you to have and maintain a sample ground of mature specimens of Pine, Fir, Spruce, Hemlock, and other Evergreen trees; no, indeed, the finer, more beautiful and perfect in form your plants, the harder a job you will have to hold them. If you keep the trees root-pruned every two or three years you can lift and transplant them with perfect safety after they are 6 or 8 feet high.

Common Names.—And, finally, let me urge you in favor of common English names. I care not how learned you are and how grounded in Latin and Greek, the plainer and more euphonious names you use the better.

A LONG-LIVED MARECHAL NIEL ROSE.

This fine Rose is, as a rule, short-lived, but one occasionally meets with an exception. The first plant I ever saw of this with good blooms on it was upwards of thirty-five years ago, and the plant still flowers well every season. This plant is grown by Mr. Adams, a jeweller, in Sherborne. When quite a youth, and serving in a large garden near, my chief took me over to see it in bloom. This was the second year of its blooming. In the early part of this year, in a conversation with its owner, he told me it had bloomed abundantly every year, and, one year, when it was at its very best, he sold £8 worth of blooms from it, and this was not an exceptional crop. It is planted out in a lean-to house. At first this house had no heat, but now for some years it has been slightly heated. It is worked on the Brier, and where the union is made the scion is three times the size of the stock. It is worthy of note how some amateurs succeed when they have a love for gardening.—J. CROOK.

CHRYSANTHEMUMS.

THE QUEEN OF AUTUMN.

REVIEW OF CHRYSANTHEMUMS, 1903.

(Read by GEORGE A. ROBINSON before the Montreal Gardeners and Florists' Club, from "The Florists' Exchange.")

In reviewing the Chrysanthemums sent out in the spring of 1903, I will confine myself entirely to those varieties I have grown myself, or have watched growing during the season at surrounding places. As is usual, some of the varieties that were sent out with a great flourish have failed entirely to live up to their reputation, while others that were sent out with less blow, will prove indispensable to both private and commercial growers.

While enlarging upon the merits of the new varieties, it will be practically impossible to ignore some of the older ones. Catalogue descriptions of new sorts make very interesting reading. And it is a good investment to secure some novelties every year. But don't discard the old one until you have found a new one to fill its place satisfactorily. A judicious selection of both old and new varieties will best suit the purpose of the commercial man, the private gardener, and the exhibitor alike.

While the new varieties were very much in evidence at our late shows, the older kinds in nearly every instance were equal, and, in many cases far superior, to the newer introductions. This of itself should not keep us from trying the new varieties, but should be an impetus to try and find out their requirements and grow them better next year. Often a variety does not show its capabilities the first year, owing to various causes, such as late arrival of cuttings, and these arriving in poor condition, overpropagation, &c.

One thing very noticeable this year was the introduction of a lot of general purpose varieties—that is, kinds with good-sized flowers, dwarf, compact growers, and good for all the purposes commercial or private growers require of them—equally good for specimen plants, and single stems. These, I may say, are mostly American raised. Quite a lot of Australian varieties were introduced the past year. These are in a class entirely by themselves. There may be some good all-round varieties among them, but I have not seen them yet. The majority of them give large flowers, but if the crown bud is not taken they invariably show an eye. Grown on a crown bud they make an immense flower, fine for exhibition; but I would advise florists to go easy on them. The same applies to the French varieties.

While the English varieties have furnished us some of the best colored ones, they are, most of them, in the exhibition classes also.

The earliest variety to flower with us last year was Opah. This is a decided acquisition; a nice pink in color, of good size, ready to cut September 25.

Polly Rose, from crown buds, was ready to cut October 5; terminals, October 12.

Glory of the Pacific, same date as above; the flowers from terminals were of much the better color.

Willowbrook, October 12. This I consider the best early white to date; a rather tall, slender grower, wiry stems, and small foliage; very graceful flower.

October Sunshine, October 17, from terminal bud; dwarf, free grower; fine yellow; excellent in every respect.

Robert Halliday, October 13. This variety improves every year; the best early yellow, of ideal habit; will stand close planting and every flower perfects itself. Will supersede Monrovia.

Omega, October 20; a nice early pale yellow; dwarf, sturdy grower; large, loose Japanese flower.

Cremo; a sport from Glory of Pacific; identical in every respect to its parent, except in color, which is a lovely shade of pale yellow.

Amorita. This is a gem. It is best described as an early Mme. Perrin; a larger flower; an ideal grower, good foliage, and strong stems.

Mrs. Coombes is a grand flower; bright rose in color; early; keeps well.

Miss Minnie Bailey is all that is claimed for it; a fine pink of Mme. Perrin type.

Mlle. Marie Liger was rather disappointing; or poor color, especially on crown buds.

H. W. Buckbee. This I consider the best second early yellow; grand color, fine flower, and a splendid grower.

Algoma, light pink; a large, handsome flower; grand for exhibition.

Globosa Alba; almost too compact.

Mrs. J. J. Mitchell; a very artistic small flower; pale cream color.

Ethelyn; light pink; is well worth growing.

F. J. Taggart, the best of all the hairy varieties; fine for exhibition; needs lots of support.

Mrs. F. J. Taggart resembles Golden Wedding; fine grower.

Miss Alice Byron. It was my pleasure to see three flowers of this grand variety grown on one stem; they were fine. The florists have long been looking for a good midseason white, and I think this will fill the bill satisfactorily.

Mlle. M. Douillet, another grand midseason white; very graceful flower, and a good grower.

Mme. Charles Diederichs, creamy white; large flower; good grower; fine for exhibition.

Brumaire, bronze; a grand exhibition variety.

Queen Alexandra, bronze; fine for exhibition.

Convention Hall; a grand commercial late white; medium-sized flowers.

A. J. Balfour, dark clear pink. This variety will certainly gain in favor as it becomes better known; an ideal grower, and easy doer.

H. J. Jones, fine crimson scarlet; the best color so far in this section.

Lily Mountford, light pink; large flower, but of poor color.

Edgar Sanders, although not a new one, should be included in every collection for exhibition.

Mrs. C. J. Salter, fine yellow; immense flower, for exhibition.

Mrs. W. B. Chamberlain, beautiful pink; good grower, worthy of a place in every collection, either commercial or exhibition.

Kate Broomhead, bronze; a magnificent flower; fine for exhibition.

George Carpenter, rosy pink; long petalled Japanese; grand for exhibition.

H. V. Casey, clear pink Japanese; large flower; good grower, and fine foliage.

Quo Vadis, an enormous flower; fine for exhibition; good grower.

Mme. Paeola Radaelli. This variety will rank among the best when better known. An easy doer, good keeper, and of fine habit.

Edward VII. is splendid if taken on a terminal bud; an immense flower; fine for exhibition.

Silver Queen, a lovely shade of pink; fine flower for exhibition purposes.

Durbin's Pride, bright pink, of the largest size; fine for exhibition.

Mme. Phillip Rogers, a very fine bronze for exhibition.

George H. Kerslake, jun., one of the good Australian commercial varieties; pure white; fine reflexed flower; dwarf grower.

Marion Newell, large, solid flower; pure pink.

R. E. Richardson. This variety, started early and well grown, is one of the best we have; a beautiful flower of a bright shade of pink.

Guy Hamilton, white; when taken on a crown bud makes an enormous exhibition flower.

Yellow Eaton. This variety is superior to its parent, the flower having a finer finish and not showing the coarseness attributed to Timothy Eaton.

Mrs. J. R. Trantor, while not a new one, is indispensable for exhibition purposes.

Mme. Von Andre, a yellow sport from Mutual Friend; poor grower.

I cannot close this paper without mentioning some of the fine varieties exhibited by N. Smith & Son at our late show. And I have it on the authority of the grower that the following will make a place for themselves, either as commercial or exhibition varieties:—

Golden Age. This is a grand yellow; a good grower, with small foliage, and, I think, will eventually replace that grand old variety, Golden Wedding.

Sunburst, of a striking color; if taken on an early bud will give a grand flower.

Mrs. Nathan Smith, pure white; good, strong, dwarf grower; every flower perfects itself under ordinary culture.

Dazzler is a grand red.

Mrs. E. Thirkell; fine for exhibition only; of good color, and an immense flower.

Dr. Enguehard is a fine pink; a good grower, and nice commercial variety.

CHRYSANTHEMUMS AT A LONDON SHOW.

Blooms Exhibited at the N.C.S. November Show.

The following figures, which relate to the number of blooms exhibited in the classes at the great show of the National Chrysanthemum Society in November last, will no doubt prove of considerable interest to readers of "Gardening Illustrated" (says that paper). A bunch of Pompons or singles is counted as one bloom. Blooms exhibited in—

	1902	1901	1900
Japanese	1,797	2,445	2,112
Incurved	471	657	864
Reflexed	24	48	60
Large Anemones	108	132	204
Anemone Pompons	12	18	24
Pompons	114	54	108
Singles	18	24	24
Total	2,544	3,378	3,396

From the figures given above it will be seen there was a great falling off in the total number of blooms exhibited on the last occasion as compared with other years. This does not necessarily mean that the Chrysanthemum has lost its hold upon the flower-loving public. The methods of exhibiting the blooms are changing, fortunately, for the better. The best of the large blooms are now exhibited in vases, instead of on the flat and uninteresting green-painted boards, which only a year or two ago were considered the only proper and orthodox way of displaying the beauty and charm of these large blooms. Blooms, when set up in vases, make a far more attractive display than when they are arranged on the boards. When arranged in vases, the space occupied by the exhibits is far larger, consequently, so many blooms are not required to make a really fine display. The falling off in the Japanese and incurved sections may be attributed chiefly to the lateness of the flowering season. Many growers could not get their blooms finished sufficiently early for the chief metropolitan fixture, and for this reason the competition was less severe than usual. By a reference to the reflexed section in the table of figures, it will be seen how they are declining in popularity. Poor as was the display of this type of the flower in 1900, when only sixty blooms were exhibited, the display on the last occasion was limited to twenty-four blooms—two boards of a dozen blooms in each. At their best these reflexed blooms are very formal. The quaint blossoms of the large Anemones and Japanese Anemones also show a considerable falling off, as compared with the exhibition held in 1900. A drop from 204 to 108 in two years is a serious matter, and points to some lack of interest by the executive, or to the want of more liberal prizes, to tempt growers to cultivate and exhibit them. The Anemone Chrysanthemums, to my mind, are among the most interesting of the many types of the Autumn Queen. Not only are the blooms quaint and curious in their form, but they are so elegant in their build and so useful for decoration that the N.C.S. might well give more encouragement to these sections. More classes should be provided, and also more liberal prizes offered, and, if it is necessary, the number of classes devoted to Japanese might very well be reduced in order to effect this. The undue attention given to the Japanese section is ousting these pretty flowers from the exhibitions, and this cannot be disputed in face of the fact that 108 blooms represented both the large-flowered Anemones and Japanese Anemones at the great exhibition of the National Chrysanthemum Society in November last. The same remarks apply with equal force to the Anemone Pompons. These beautiful free-flowering Chrysanthemums were represented by twelve small bunches on the last occasion, against double this number in 1900. This is a matter for regret, and interest in these lovely flowers should be stimulated by providing more classes and offering liberal prizes. The Pompons appear to be holding their own fairly well, but 114 bunches are, after all, a meagre display. Much cannot be said for the singles, as November is really too early to see them in goodly numbers and at their best. The rigidly disbudded blooms which are usually exhibited are made to look so formal, and the machine-like regularity of their setting up detracts from their beauty.

Those responsible for the schedule of the National Chrysanthemum Society have much to learn. All who are interested in further popularising the Chrysanthemum look to the National Society to set an example to other Chrysanthemum societies throughout the country. With the new move, which is now inevitable, the N.C.S. might well begin a new era of usefulness. The antiquated ideas which have characterised its movements all too long will have to give way to newer ideas, and the more enlightened and up-to-date methods of exhibiting, in which, of course, all sections of the flower should have due consideration, and the display, in consequence, be thoroughly representative, should be the rule. The society has now a splendid opportunity for making a clean sweep of—and ridding itself of—out-of-date and antiquated methods of exhibiting Chrysanthemums of all types and of all sizes.

—A. R.

TWO NEW CHRYSANTHEMUMS.

Two new chrysanthemums have come under notice on several occasions. One of these is the new Australian seedling raised by Mr. Pockett, and named Charles Longley: in the earlier flowers the florets incurve a good deal and show up the silvery rose reverse, but in later blooms the broad florets lay out better, and only incurve at the tips, thus rendering them more effective by reason of the greater display of the amaranth purple color, which in this variety is exceptionally rich.

Matthew Russell is the name given to a new incurved chrysanthemum that was raised by the late Mr. M. Russell, and distributed by Mr. Jones, Ryecroft Nursery, Lewisham. It is an easy variety to manage, and produces medium-sized flowers of a bright chestnut or mahegany color that is most attractive. The variety was shown at a recent R.H.S. meeting by Mr. Jones, and also by Mr. Godfrey, of Exmouth; in both cases the Award of Merit was granted. Mr. Jones showed a large number of blooms.—"The Gardeners' Magazine."

CHRYSANTHEMUMS IN VASES AND BASKETS.

Much as the introduction of the vase into competitions at shows was hailed with satisfaction as a welcome change from the hard lines seen in long ranges of show boxes, yet it is now found that nohow, apparently, can big rotund mop-like blossoms be made to look, however set up, pleasing or beautiful. The inherent objection lies more in the size of the flowers than in the setting up or the price of vase or basket employed for the purpose. A singular contrast, so far as elegance, grace, and beauty are concerned, to these big show blooms, however arranged, was seen in the charming basket of Chrysanthemums set up by Miss Easterbrook, Fawkham, Kent, at the last meeting of the Royal Horticultural Society. Here quite medium-sized double with beautiful pure white singles, and some of the thread petalled varieties mixed with pleasing foliage made up in the basket a truly charming arrangement that was well worth an illustration if but to show how to do things similarly. No vase or basket of big fat blooms could possibly look so beautiful as this basket did. No doubt, because of the prevailing craze for large blooms as seen at shows, Chrysanthemum growers have got to regard these big flowers as beautiful, whilst smaller ones get very little recognition. It is, if so, a grave mistake. Medium-sized Japanese, pretty Pompons, Anemone Pompons, and singles make up when tastefully used graceful combinations that far excel any that fat flowers can produce. A crusade against big blooms seems to be inevitable as taste becomes more refined.

—A. D.

[The arrangement above referred to was one of the most dainty we have ever seen, the flowers being lightly and tastefully set up, and without that heavy, lumpy effect which is inevitable when the big fat blooms are shown in vases. The basket shown at the Royal Horticultural Society was filled with fine white single Chrysanthemums, associated with the thread petalled white blooms of the Mrs. Filkins type and Fern fronds, a light and elegant effect being in this way secured.—Ed.]

NOTES AND REPLIES.

Single Chrysanthemums.—Could you kindly give me the names of some good single Chrysanthemums, and if any grower makes a speciality of them? I have one, and it has stood frost, rain, and wind out-of-doors so well, I am anxious to get a variety of colors.—C. G. O'Brien, Foynes, in "Gardening Illustrated."

Mary Anderson, white, changing to blush, is probably the best known of all, and its tawny yellow sport, Miss A. Holden, is also good. Miss Chrissie, bright terra-cotta, is brilliant while the flowers are young. Buttercup bears many-flowered erect sprays of rather small, round blooms, butter-yellow in color. Emily Wells is one of the very best, with bright rose, medium-sized flowers that stand erect on long sprays. Prolific is rather large. The flowers, which open blush-colored, mottled with white, soon change to a paler hue, and are then very much like those of Mary Anderson in form and color, but larger. This is a very free variety. Snowdrift is a useful white variety. For those who like very dark crimsons, Annie Tweed will prove a charming variety, very much like Mary Anderson in habit, form, and size. Useful late varieties are Admiral T. Symonds and Kate Williams, both large-flowered yellows. Mrs. A. E. Stubbs, creamy-white, of good form, with fairly long, narrow-pointed petals; Framfield Beauty, rich crimson; Jane, white; Yellow Jane; and Purity, white, are also good.

Large Chrysanthemums.—Mr. C. J. Grist very correctly defines the feelings of many lovers of beautiful flowers in his remarks concerning the monotony of the big blooms at the Aquarium and other autumnal shows of this popular flower. There is not the slightest doubt that the financial crisis to which he refers will become much more acute, unless steps are taken to introduce more variety, for the simple reason that when you have seen one show of these monster blooms you have seen them all, for they vary so little as to become wearisome. There is no doubt that big blooms, cut with long stalks and foliage, set in vases, take the eye of the visitors much more than the flat boxes, and when we turn to the groups we find the big bloom plants far less effective than the naturally-grown and not disbudded ones. The majority of provincial shows find a difficulty in keeping up the interest in these shows, and have to add classes for miscellaneous groups of plants, table plants, winter-flowering Geraniums, Cyclamens, Primulas, &c., and not the least effective aid is given by the Begonias of the Gloire de Lorraine type as pot plants. —J. G., Gosport.

Old Chrysanthemums (Manxman).—If you have room in a cold-frame or greenhouse, do not be in too great a hurry to throw old stools of Chrysanthemums away, even if you have taken what cuttings you want—accidents will happen. Old plants will winter in a cold frame if covered up on frosty nights. Where decorative Chrysanthemums are grown, often these old plants turn out the best, and bloom earlier than those from cuttings, and should be planted out in the borders in April. Stirring the soil about the roots and introducing a little fresh will induce many that are backward to send up suckers, but cool treatment should be the general rule.—Woodbastwick.

NATURALLY-GROWN CHRYSANTHEMUMS.

The term "naturally grown" is usually given to Chrysanthemums that are made to develop a bushy form, and which are not subjected to the severe disbudding necessary if flowers of exhibition quality are desired. It is, however, a misnomer, for, strictly speaking, a naturally-grown plant would have neither its shoots stopped nor any of its flower-buds removed, both of which operations are nearly always practised. In growing Chrysanthemums of what may be termed the exhibition type, the sole object in view is to obtain flowers at once of the largest size and as near as possible of the form that has been set up by the florist as an ideal one. In the cultivation of that class with which the present observations deal, the aim is entirely different; it is, in a word, the beauty and effectiveness of the plants as a whole rather than those of the individual flower. In growing this class of plants it is of great importance that each should be clothed with foliage almost or quite to the base of its stems, and that whilst the shoots should be disposed and supported so as to secure sufficient symmetry of form, the stiff outlines and unwieldiness of the "specimen" plant of the exhibition should be as carefully avoided. With regard to the flowers themselves, the aim should be to obtain them large enough to show the true and distinctive character of the variety, and yet in sufficient number to fully furnish the plant, thus avoiding the wasteful process which accrues from restricting the energies of the plant to the production of two or three flowers.

It is questionable whether, by encouraging so exclusively as exhibitions do the big flower and the conventional specimen plant, the true interests of horticulture are furthered as much as would be done by adopting a system of culture that requires as much real gardening skill to obtain the best results, and which, from an artistic standpoint at least, are infinitely more pleasing. The groups of plants seen at even our best shows, with their carefully sloped surfaces, look brilliant and gorgeous enough at the top; but to the inquisitive eye that searches below there is revealed a huddled mass of long stalks and pots (the latter not unfrequently stood one above another), which is to the last degree unsightly. Looked at singly, such plants are hideous, and even when massed together in a formal sloping bank, which is the only arrangement they are presentable in, the few square yards of color they give cannot be said to be an adequate return for all the expense and labor they have entailed during the previous twelve months.

When writing upon zinc labels make sure that the surface is thoroughly clean, or the name written may soon be obliterated.

CHARACTER SKETCHES OF FLORISTS.

"Has it ever occrurred to you?"

This was the title of the toast chosen by Lewis Ullrich, of Tiffin, O., on the occasion of the Detroit Florists' Club banquet tendered the American Carnation Society in Harmonie Hall. Mr. Ullrich's words have such a true ring to them that we reproduce them, feeling sure they will be read with interest by every subscriber for "The Florists' Exchange" (says that journal). He said in part:

"Has it ever occurred to you that the practical florist, as a rule, is a whole-souled person in whom the trait of good fellowship is a sort of second nature? You will generally find him with a deep sense of honor and a sincere wish to do what is right between man and man. The real florist is easy to approach, has a welcome for everybody, and a hearty handshake that carries a feeling of friendship with it, which shows that his heart is in the right place. He may be a man not possessed of many of the higher attainments of life; but by nature he has an inborn love of the beautiful, and is possessed of a great amount of patience and perseverance, or he could not content himself to carry out the many details required in growing plants and flowers successfully. Florists are usually a contented class of people; not grumblers, kickers, or fault-finders, or envious of the more successful ones; but willing to give credit for what they know and what they have done. The real, practical florist is always willing to give the less experienced the sought-for advice or information; and you will invariably find him a faithful husband, an indulgent father, and a law-abiding citizen.

"Has it ever occurred to you that, as nearly every flock has its 'black sheep,' so the fraternity of florists has an occasional one—one who has not got the true sense of honor; with willingness to be accommodated and obliged; is a florist in name only; is selfish, conceited, arrogant, and, to use a slang phrase, 'is stuck on himself?' Has it ever occurred to you that that man has no use for you, only so long as he sees profit in your acquaintance? Then he does not care how he meets you. He may mortify you with a snub to a civil question. Such a man is so filled with vinegar, that the nobler qualities which go to make the man find no place in him. It is advisable to steer clear of such a character; for life is too short and the genial characteristics too plentiful to waste any time on such an individual."

Mr. Ullrich then went on to tell of the benefits accruing from attendance at the meetings and exhibitions of the American Carnation Society, and of the good that organization had done for the florists' trade, adding: "Has it ever occurred to you what the stay-at-home florist has missed by not belonging to this society—he who thinks he knows it all; the fellow who says, 'They can't teach me anything?' Such a man you will usually find an 'old fogy,' a back number, his place of business generally dilapidated and disorderly, looking more like an old junk shop full of broken pots, empty boxes, and dead plants standing around, tumble-down benches, muddy walks; his tools out of place; in fact, he has no place for anything, spending more time in looking for a tool than he does in using it." Mr. Ullrich advised such a man to go from home occasionally and learn something. He must profit by the experience of others if he wishes to be progressive.

Continuing, he said: "Has it ever occurred to you, young men of the society, that some day not far distant, when the older men will have stepped down and out, when the 'Angel of Death' will have knocked at their doors and they have gone to their reward in the Great Beyond, that you, young men, will have to take the places left vacant by their demise? I would advise you to employ every moment of your time to improve yourselves. Strive to become proficient in every branch of the work, from the wheeling of soil up through the various details in growing and producing good plants and flowers. Learn how to dispose of your product at a profit. Adopt a good system of bookkeeping; and be sure to learn how to be a good, prompt collector of bills, for that is the great 'finale' of all your labors. And while at the conventions, attend closely to the business meetings; be observant, take part in the discussions and profit thereby, so that when you are called upon to take your place in the management of the affairs of this great society, you will be prepared to do so."

Mr. Ullrich closed his address with a well-merited compliment to President Rackham of the Carnation Society; Robert Flowerday (President), and J. F. Sullivan (Secretary) of the local florists' club; President Breitmeyer, of the S.A.F.O.H., and the craft in Detroit generally, for their kind hospitality. His remarks were loudly applauded.

ROSES.

THE ROSE AND ITS USES.

(CY THE REV. C. DUDLEY LAMPEN.)

Not only for its color or odor has the most favorite of our flowers endured the test of time. There are in the Rose medicinal properties, astringent and tonic in character. The Pharmacopœia indicates three kinds as useful—the Rose canina, or common Dog Rose; the R. Gallica, or French red Rose; and the R. centifolia, or Cabbage Rose. Of the Dog Rose the valuable part is the fruit from which the hairy achenia is removed and the fleshy calyx beaten to a pulpy consistency and mixed with sugar. Thus is produced a conserve, containing malic and citric acids, and said to be slightly refrigerent and aperient. The fresh seeds of this Rose are in some parts made into an infusion, and the mild astringent drink is used by those who in swampy districts suffer from malaria.

At one time the district about Mitcham, in Surrey, supplied large quantities of petals of the R. Gallica and the R. Damascena for the London herb market, these being purchased by herbalists for the concoction of their drugs. The process of the preparation of the flowers is curious. Before they expand the buds are plucked and the calyx and base of the petals removed. The flower is then dried as quickly as possible in order to preserve its astringency, fine aroma, and color. It is calculated that about 2,000 buds yield 100 lb. of petals, and that these when dry weigh only 10 lb. The taste of the herb is bitter.

Another curious use is made of the same buds. It is found that combined with salts of iron, and beaten up with cloves and other spices, a thick paste of blackish color is produced. This paste, on exposure to the air, becomes exceedingly hard, and may be polished and turned in a lathe; from it are formed beads for rosaries.

From the petals of the R. Damescens and R. semperflorens a laxative medicine can be produced, though it is seldom employed. Curiously, although the confection compounded from the Dog Rose speedily becomes mouldy, that made from these Roses never does so. In mixing the medicine an iron mortar cannot be used on account of the peculiar action of the Rose juice when in contact with metal. Conserve of the Gallic Rose is used as a vehicle for other medicines, and as a basis for blue pill.

To produce an infusion of Roses, boiling distilled water is poured over the petals, and dilute sulphuric acid is added. After macerating for some hours the liquid is strained and sweetened. No vessel glazed with lead can be used in this process, as the Rose juice acts thereon as it does on iron. The liquid is astringent and slightly tonic, and at one time was largely used to check excessive sweats, as well as for a throat gargle. In the latter case it is mingled with honey, and is called Mel Rosarum. The syrup used to sweeten and color medicines is manufactured in a similar way.

As a deodoriser the Rose serves long after its own death. The petals of Rosa centifolia, having a very strong perfume, were at one time largely collected and saved after having been dried in the open air, care being taken not to break the several leaves; for in this case (contrary to the R. Gallica) desiccation impairs the fragrance. Salt is added, with cloves and a little pepper, and the compound is placed in pots, from which ascends a perpetual though very mild scent.

Whereas in the south of France there are extensive distilleries where the scent known as rosewater is manufactured (as well as at Mitcham, Surrey), Oriental countries produce the far more subtle and costly scents known as athar, ather, attar, utter, or otto of roses, one of the rarest and most valuable of perfumes. Much mystery at one time surrounded the production of this famous drug. A certain Donald Monro asserted that it was produced by merely soaking the Roses in water. But Trommsdorf, after many experiments, failed to extract the attar thus. Others maintained that it was produced by distillation. Anglo-Indians, in the earlier days of our dominion in India, certainly discovered something about its production. Thus Bishop Reginald Heber of Calcutta, in 1823 (his bishopric including Australasia!), states that the Hindoos in his day used 20,000 lb. weight of Roses to extract attar equalling 1 rupee in weight, this selling for 100 rupees. Such a statement would scarcely be credible had we not the good bishop's word for it. But he may have been mistaken, or was imposed upon.

A Mr. Jackson states that "from 1 lac of Roses it is generally calculated that 180 grains . . . of attar can be produced." Others have calculated the yield at something under 3 drachms of attar from 100 lb. of Rose leaves, and this when the season is good and the manufacture carefully performed. These authorities on the production of the perfume state that 4,366 lb. of Roses, after repeated distillation, yield 8 oz. of this subtle essence. In India the R. Damascena is largely cultivated for the production of this scent. The oil or attar is skimmed off after a method adopted in Turkey.

Kezanlyk in Roumelia is the great European centre of Rose culture for the manufacture of this wonderful perfume. The flowers grow in a highly fertile plain, which is well watered by the River Tunja.

A substance known as English attar has been extracted from Roses grown in this country. Its scent is very faint compared with that which is made abroad. The extraordinarily high price at which the foreign perfume is sold presents a great temptation to dishonest traders. It is commonly reported in India that the attar is adulterated by the mixing with the Rose leaves certain seeds called Guezely, as well as with those of a variety of Digitalis known as the Sisama plant. These seeds, which contain an essential oil, are lightly pressed for a period of ten days along with the Rose petals, thus absorbing their scent; the process is repeated eight or ten times with fresh Rose leaves, after which the seeds are pressed hard to extract the oil. By this time it has acquired a smell which entitles it to be sold for the attar which it is not. The Chinamen have a similar dodge.

The genuine attar of Roses, below the temperature of 80° F., is of crystalline nature and solid. When very pure it is without color; when the temperature is raised to 90° its specific gravity is 0·832. The chemical structure of the perfume has been much discussed, but it seems now to be generally agreed that it consists of two volatile substances, of which the one is solid, the other liquid, in the proportion of 1 part of the solid to 2 parts of the liquid. The first is a stearopten, the last an eleopten. The chemist Gobel states that the entire "oil" consists of carbon 69·66, hydrogen 16·06, and oxygen 14·28; but Saussure contends that it contains nitrogen. The exceedingly variable nature of the substance which is sold as attar accounts for these diversities of opinion, for it is so costly that its adulteration is universal. Curiously enough, its admixture with other essential oils (such as those extracted from Indian grass, Andropogon, and Acorus calamus), or from sandalwood, or from Rhodium (Convolvulus scoparius), renders its adulteration very difficult of detection.

The great value of this perfume causes it to be carefully conveyed over inland routes by Asiatic merchants to Smyrna in Asia Minor and to Constantinople. The Sultan of Turkey imposes a duty on its importation.—"The Gardener."

SOME GOOD NEW ROSES FOR POTS.

Probably old-established kinds, such as Catherine Mermet, Bridesmaid, The Bride, Perle des Jardins, will not be superseded as forcing Roses in our time, but the years 1901 and 1902 have given us some particularly good novelties that are steadily making their way to the front. One of the very best of recent novelties is

Frau Karl Druschki. I should not so much recommend it for hard forcing, believing it to be a variety that will be seen at its best in a gentle temperature. One of the grandest blossoms we had last season was upon a specimen of this fine Rose. For market it will prove invaluable, especially where the American style of long-stemmed blooms is in request. It really seems as though Dean Hole would see what he prophesied when he referred to "our children's children plucking their snow-white Marie Baumann—pure as sunshine dancing on a white dove's wings." The form, perhaps, is scarcely so regular as in Marie Baumann, but certainly the shape of Frau Karl Druschki is very beautiful.

Mme. Antoine Mari has been admired by all who have seen the Rose. It is one of the most distinct varieties we have had for many years. The raiser is M. Mari, of the Nice Public Park, and from such a beautiful district other good kinds should be forthcoming. I believe

Mme. Vermorel is also from the same raiser. It is just that fine deep, full flower so dear to the heart of the exhibitor, and it has the yellowish color of Jean Ducher, with a shading of rose. The growth is strong, and we have in this variety a first-rate novelty.

Dr. F. Guyon seems to be a near relative, perhaps from the same seed-pod as the last-mentioned, but yet sufficiently distinct to be worth growing.

Ben Cant.—The rich, glowing color and grand form of this, together with a vigorous growth, are all points that go to the making of a good pot-Rose.

Lady Roberts comes of a good stock. It is reputedly a sport of Anna Ollivier, and all who have grown pot-Roses know what a fine kind the latter is under glass. It is only recently the sportive habit of Anna Ollivier has been noticed, although many Rose growers believe Mme. Hoste to be one of its first sports. The sturdy habit of all three should ensure them a place in the most select collection of pot-Roses.

Mildred Grant is a magnificent Rose, grand in petal and upright in habit.

Pauline Bersez and Prince de Bulgarie are two fine additions to the Hybrid Teas, the one after the style of Mme. Cadeau Ramey, only flatter, and the other resembling Souvenir du President Carnot. They both come from a raiser who has given us some of the best Hybrid Teas in cultivation.

Perle Von Godesberg and Duchess of Portland are of the Kaiserin Augusta Victoria type, the former claiming to be a yellow sport, but as seen very little yellow is present; the other evidently a glorified Kaiserin, which will perhaps eventually take the place of the parent.

Boadicea, when grown in heat, is very beautiful and highly fragrant. Its open flowers have a tendency to fade, but in the bud state there is no more beautiful kind than this one.

Lady Battersea is perhaps seen at its best in the forcing-house, where its bright rosy-crimson color and fine long stems carrying exquisite buds are very welcome. It is reputedly a cross between Mme. Abel Chatenay and Mrs. W. J. Grant, so that should be sufficient guarantee that the Rose is a good one.

Mme. Jean Dupuy I much like. It is a fine sturdy grower, with beautiful bold flowers of a rosy-yellow color.

Mme. Marie Croibier and William Askew are evidently seedlings or sports of Caroline Testout, and, as such, welcome and distinct additions to a popular group.

Robert Scott has evidently come to stay. It is one of the few good novelties from the States, and it has the free-flowering and continuous habit of the true Teas.

Soleil d'Or is a Rose of remarkable individuality, capable of great things as a pot variety.

Souvenir de Mme. Chedane Guinoisseau should be good, if only to compensate for its long name. That it is good I can testify. It is a fine flower of a very bright red color.

Souvenir de Pierre Notting at present falls far short of its reputation, but, notwithstanding, it is a Rose of great possibilities.

The above are the cream of the novelties of the last two years.—Rosa in "Gardening Illustrated."

THE CACTUS DAHLIA.

(BY A SUCCESSFUL RAISER.)

Before giving attention to watering and feeding, I should like to mention a rather important item in the thinning. When strong young growths push up from the lower parts of the plants, always leave them, and some very fine flowers will often result. Now, when the plants get about halfway up the stakes and are beginning to throw buds plentifully, should the weather be dry they will require copious waterings, and at first must have nothing but clear water. If this can be had from a pond so much the better, but if from a well or from the main it is greatly improved if it can stand awhile in the sun in tubs. Very soon the plants will be drawing heavily on the natural resources of the soil, and will require manure in some form if fine blooms are to be matured

A very good plan is to put sheep manure in a bag and place it in the tub, stirring till a good strong "brew" results. This will need frequent renewing, for the Dahlia is a very greedy customer. Also change the diet, giving a dose of soot with other manures now and then. If the weather be dry day after day, do not play with the water can, but give each 2 gallons, and then leave them till dry again. The advantage of this is apparent to anyone who studies the matter, and as I have noticed that amateurs are often exceedingly unwise in their manner of giving water, I should like to explain to them that if they give 2 gallons of water in three or four different waterings the plant benefits very little, as each day, the soil being wet only on the surface, the sun drys up every particle of the moisture, and so, after having had its 2 gallons of water, the plant, apart from its passing refresher, is little better off; whereas, if the whole is poured on at once, in a circle round the plant about one yard across the under soil is well moistened, and the plants get something to feed upon. Give water with manure in it as often as needed, which, during hot, dry weather, is about twice a week.

If artificial manure is preferred, I think guano as good as anything, but it should be given carefully, and not with the idea that the more manure the better the bloom. I would advise sticking to natural manures for the most part, as conducing to a more natural and healthier growth. If exhibition blooms are the object for which the plants are grown, guard against letting them bloom too freely before the show time arrives. It is not unusual for beginners to have very fine flowers just when they are useless, and on the day of the show to find hardly a decent bloom anywhere. The only way to ensure blooms at the right time is to keep the buds cut off until it is safe to leave them, always reckoning that from the time a bud shows till the flower expands is about a month. On the other hand, there is such a thing as to be behind, and so be sure to leave buds to flower soon enough to allow for the changes in the weather, and not be caught in a cold, bad spell with buds where blooms should be.

THE CANADIAN LILY (L. Canadense).

Orange and brown spotted flowers of this, borne on slender stems, are welcome in late summer, especially when appearing from amongst an undergrowth of shrubs. It succeeds well in London, and should be made use of in the parks and open spaces, which require color in the declining days of summer. The Orange Lily, L. davuricum and L. chalcedonicum are good garden Lilies, but the latter is best seen in northern counties or Yorkshire, where it is common in cottage gardens, and of finer growth than in more southern districts. Few Lilies thrive more freely than L. Martagon, the variety dalmaticum in particular. It is an exceedingly beautiful form, very telling when allowed to form a large clump, or establish itself in the wilder parts of the garden. L. M. album is a suitable companion to it, and, like all the forms of the Martagon Lily, quite hardy, very free in growth and bloom, preferring shade, but not refusing to grow in the sunlight.

There are a few groups that should be considered when planting Lilies in the open. Among these may be mentioned L. pardalinum (the Panther Lily), with stems rising to a height of 8 feet, and seen to best advantage with shrubs as a groundwork. L. pomponium, too, must not be forgotten, as also the forms of L. lancifolium. The autumn is the season for these. They remain longer in bloom than any other Lily, commencing in September and lasting many weeks in full beauty. A gay succession is kept up by the forms of L. tigrinum, the earliest of which begin to flower in August, the latest lasting till the end of October.

MAYFLOWER (EPIGÆA REPENS).

Being a great admirer of our Mayflower (Epigæa repens) I was interested in a recent "Garden" note which alluded to the lack of interest shown in its garden cultivation, speaking of it as "really too sweet a subject to be neglected." While I fully agree with this sentiment, experience has taught me that this charming and modest little wilding is one of the most difficult of all forest plants to grow successfully in the garden. Indeed, I have yet to see a single instance in which its obstinate wild wood nature was sufficiently subdued to make it succeed at all away from its habitat even under the greatest care in providing the most suitable conditions. Your writer speaks of the plant thriving best on an eastern aspect, which surprises me, because when I find it in this region it is always on a western slope or exposure, and usually on high ground where moisture can rarely accumulate. There is evidently very much for us to learn yet in regard to the requirements of this lovely little plant. But possibly if we knew it all we might not admire it half as well —H. Hendricks, Kingston, N.Y.

Correspondence.

TO THE EDITOR.

Dear Sir—Your note and box "with a beetle" duly to hand, and I may state at once that if the specimen sent be a true representative of what "is spoken of as a bad destroyer amongst the cabbage gardens', it must be bad indeed, for the "thing" has neither a mouth nor brains to use, not even a head! Of the six legs it ought to have, only indications of four are present, and these are without feet. How could one recognise a fellow without head and neck, and with his hands and feet chopped off? How could he have "destroyed" unlimited quantities of juicy cabbages and lettuces without jaws to munch, a gullet to swallow, or a stomach to digest, let alone the incapacity of walking or climbing about? But joking apart, as I happen to have an inkling what the complete "bad destroyer" may have been like, I may say that it was a member of the scarabaeid family, and belonged to the genus Isodon, perhaps the species I. pecuarius, which is a very common one where there is rich loose soil, or much decaying manure, but not of the stable variety. In these and of these the larvae or grubs (i.e., the young) live; the beetles themselves live on foliage of gums and other green leaves (perhaps), but I never heard credibly that they anywhere occurred in such great numbers (hundreds per square chain) as to be physically capable of inflicting any really appreciable damage. It is only a bijou edition apparently of the growers superstitions about the crows, etc.:—Damage is done; there are the birds pecking, therefore the birds must be shot. The real culprits in the latter case were and are the small grubs and caterpillars beyond the ken and recognition of the "man of practice," of which the birds tried to free him, and in the case of that of the comparatively few, but large beetles—scores, hundreds or thousands of small, or even minute, grubs, caterpillars, slugs, etc. I once examined a small tobacco tinful of soil brought to me with some larger larvae (about half a dozen) accused of eating the roots of chrysanthemums, and found in it some scores of half a dozen kinds of minute but real destroyers. The "opinions and beliefs" of the working man regarding natural history are not always reliable. Over-manuring not only produces great crops of vegetables, but usually also of animal life difficult to check. Hand-picking the large beetles before sunrise—as the services of ducks, etc., cannot be invoked—seems the only remedy in this case.

Yours truly,
J. G. O. Tepper.

SWEET PEAS.

The report of the National Sweet Pea Society of Great Britain has been issued, and must be a gratifying one to the members of the society. The exhibits at the principal show were so numerous and extensive that it proved necessary to add 300 more square feet of space than was thought would be necessary.

A list of the most approved sorts to grow has been drawn up under the auspices of the society. At the conference held the following are given by authorities as the "Properties of the Sweet Pea":—

"Form."—The standards must be erect, waved, or only slightly hooded. The standard, wings, and keel to be in proportion to each other, as will constitute a harmonious and well-balanced flower

"Number of blooms on a stem."—No variety shall be recognised that has not at least three blooms on a stem, gracefully disposed.

"Color."—Distinct and self clear colors are most to be desired, and therefore striped, watered, and edged flowers will not be awarded certificates of merit, unless they possess quite new and remarkable combinations.

"Exceptions."—Perfectly distinct new colors, such as approaching the blue of Salvia patens, the yellow of coreopsis grandiflora, or the scarlet of the zonal pelargonium shall be recognised, even if the variety shall fall short of the foregoing properties.

On the completion of the judging on the first day of the exhibition, the committee met to consider the merits of the new varieties, of which some two or three dozen were shown. First-class certificates were awarded to Florence Molyneux, Cupid Her Majesty, Cupid Lottie Eckford, Scarlet Gem, and King Edward VII. The first raised by Dobbie and Co., the two next by Connell and Sons, and the two last by Hy. Eckford. The silver medal of the society for the finest novelty of the year went to Scarlet Gem, and the award was unanimous.

SEAWEED.

Seaweed is looked upon by farmers along the Atlantic coast in America as a very valuable fertiliser. They cart it as far as 12 miles back into the country, spreading it on the pasture lands and on the fields which are to be ploughed for corn and potatoes. Many claim that it is more valuable than stable manure. In this respect it possesses the special virtue of containing the seeds of no noxious weeds, and none of germs of the diseases which attack potatoes and other roots. A ton of seaweed dried to 15 per cent. moisture, contains 33 lb. of nitrogen, 8½ lb. phosphoric acid, and 35 lb. of potash. Phosphoric acid, which is worth about 2½d. per lb., is, according to former experiments, the only fertilising element needed. If that be the case, the fertilising value of the seaweed would not pay the trouble of transporting it. Where the nitrogen and potash are useful as fertilisers, the nitrogen being worth 6d. per lb. and the potash 2d., there is a considerable fertilising value in a ton of seaweed. Then, I am told that, in this dry climate, the seaweed rots very slowly, and that when it is ploughed under it so opens the pores of the soil, and admits the drying air so freely, as to very rapidly dry out that portion of the soil in which the young plants live. I really wish I could have a few tons of the seaweed to try, for I think I could get some good out of it; but in the face of what I know about it at present, I cannot put my approval on any proposition which means the outlay of any considerable sum of money to utilise seaweed in South Australia. It might be used with advantage in districts especially favored with rain and as a top dressing for city lawns.

WEEDS.

(A Paper read at the November meeting of the Hawkesbury Agricultural Society.)

By C. T. Musson.

(Continued.)

Weeds Sometimes Favorable.

We may now consider certain favorable points to be credited to weeds, which should by no means be omitted. (a) They are useful as covering the soil surface in times of dry windy weather: better, of course, to have a green manure crop of a more valuable nature doing so, some legume for instance; but, failing that, weeds will prevent the blowing away of soil from about the roots of trees. We have had apple trees killed by this baring of the roots, whilst experimental crops of young cereals have been partially or entirely smothered by blown sand. Naturally, "timing" in connection with the wind is the difficulty.

(b) In hilly districts weeds, if present, will prevent the washing away of soil: a source of much irritation and subsequent labor in certain places. Here again, a regular rainy season is requisite in order to take full advantage of such a circumstance.

(c) Many weeds in pasture country help to make up a good food mixture for stock —giving tonics, bitters, purgatives, and so on; useful and indeed necessary to good health. An increase in the proportionate amount of any one of such articles of food might, however, cause serious trouble. In some cases they give valuable winter food, as in crowfoot and clover burr.

(d) They supply green manure to the soil when ploughed in, but not of such bulk and character as a clover or rape crop for example.

(e) They help to draw material for plant food from deep down in the soil, which is soon rendered available when the weeds are ploughed in.

How Weeds Originate.

We may now consider shortly how we get our weeds. Where do they come from? Most of them have been introduced from other countries without special intent—in dirty seed; in the packing of merchandise, hay, straw, &c., being often used for this purpose. I have taken thirty-five species of recognisable plants from meadow hay in which glass beakers have been packed, some of them of a detrimental nature. Large collections of weed seeds have been obtained from linseed, cereal, and grass seeds.

Once here weeds spread rapidly: largely along the railways and roads; by means of travelling stock; in manure; through the agency of birds and of the wind; by means of floods and through various human agencies. Weeds new to the country are constantly being found; only lately two new kinds were recorded from the Liverpool Plains; both useful adjuncts to our list of winter fodder plants. One plant was, however, lately recorded from this district which is parasitic on grass roots—yellow rattle, which has nothing to recommend it.

All our weeds are not introductions from abroad; some are native to the country, and are becoming plentiful in our paddocks; for example, Cotula, a small composite and a milk tainter; whilst we have a large series of native plants injurious to stock.

Eradication of Weeds.

To you more interest perhaps attaches to the question of treatment, if any can be advised, in connection with getting rid of weeds. I must candidly confess I have nothing fresh to give in this way. No process is yet known by means of which we can readily do away with weeds. But there are some few points which may be briefly considered to advantage in this connection.

Every farmer recognises the necessity for keeping weeds down, and in his own way does something to that end; but usually not knowing the reputation of new comers, frequently loses an opportunity of stamping out what later becomes a nuisance. How many men go out of their way a few yards to chip a weed out, or even a small patch—and thus prevent a particular weed from spreading—except it be in the course of this work in their cultivation paddock? I know patches of certain weeds that it would be a distinct benefit to obliterate—of Chamomile, Stramonium, and Prickly Pear for instance. In Richmond it may be noted the authorities are actively engaged in cutting down all noxious plants, thistles, and Bathurst Burr chiefly. If we consistently cut out the early visitors, we have a chance to prevent serious invasion.

There is every reason, one might say, for weeds spreading. Our farmers give no time for their eradication. I mean specially in corners and along selvedges of paddocks, on the roads, along the river banks, and in grass land. It is of course a tremendous task, and if time and labor are not given to it, under our conditions it is difficult to spare them. It is a distinct disadvantage to us in fighting weeds that we have no rest from cultivation here. Crops can be grown the year round; there is no period of "no-outside-work," like the English winter, when the farmer takes his spud with him in his walks; cuts up his weeds, trims his hedges, and clears out his ditches.

The means we have at our disposal for coping with any special weed manifestation are numerous. Briefly, we may arrange weeds for practical treatment, into—(a) Such as can be left alone, being of no special account, or because we can hope to do nothing in getting rid of them, as the small things in grass land; (b) Such as we must, and do, keep down by regular cultivation; (c) Such as for some reason are specially noxious; as poison or tainting plants (like the wild carrot), or permanent denizens like prickly pear and sweet briar, and such as occupy ground wanted for better things (as thistles and burrs in grass land).

Of groups a and b nothing need be said; but of the third group c, which falls outside such as come within our reach in the ordinary processes of cultivation, it may be said that some special method must be adopted for their extermination according to the special needs of the case.

In eradicating weeds we need to note whether they are annuals or live longer than one year. In the former case prevention of seeding eventually kills them out. The longer-lived ones are more difficult to deal with; prevention of seeding, however, gradually reduces their numbers. Always remembering the labor involved, the following methods may be resorted to as found convenient. Applications of arsenite of soda (cost 4½d. per lb. in bulk), 1 lb. in 1 gallon of water. This kills most weeds at least to such extent that the stumps (as in prickly pear) can be got at after burning off the dried-up plant. Salt in boiling water is a cheap and certain weed killer; as is boiling water alone for succulent plants.

The Orchard.

GROWING APPLES FOR EXPORT. FROM HOBART TO THE HUON.

By E. W. Castine in the "Register."

The visitor to Tasmania via Hobart at this time of the year is at once struck by the preponderance of the apple industry over all others. As the steamer draws up to the wharf one immediately recognises the immensity of the industry. Wharfs are stacked with thousands of cases of the fruit waiting for the largest ocean boats to relieve them temporarily in order that thousands more may come in. With a week to spare in Hobart, we decided to have a couple of days' trip in the Huon district, and to that end Monday morning saw us seated on top of one of Rometsch and Duncan's brakes with 14 others bound for Huonville. The day was perfect, and I should imagine the drive one of the most exhilarating to be had in the Commonwealth. Leaving by the Cascades-road we ascend Mount Wellington by twist and turn until we are 3,000 ft. above sea level and within 1,000 ft. of the top, which is usually snowclad. The half-chain road made by convict labor in the early days is good, and the scenery beautiful. The hillsides are covered with vegetation, and conspicuous among the trees are the immense bluegums running up 100 ft. without a branch. Treeferns line the roadside in places, and show out here and there among the hillside vegetation. Every now and then we pass a streamlet tumbling down the sides of Mount Wellington on its way to the sea, glimpses of which can occasionally be seen to our left. Raspberry plantations are in evidence all along the route, and the blackberry grows wild in the hedgerows. About 11 miles from Hobart (half-way) we change our four horses and mule for another team, and with mostly down grades, passing numerous apple orchards, we arrive at the Picnic Hotel, Huonville, two and a-half hours after leaving Hobart.

Among the Orchards.

After dinner a start is made for the orchards and packing sheds. The apple crop is good, but not exceptional. About a mile on the Franklyn-road we call at Mr. Shiels' orchard. He has 12 acres in bearing, and expects to pick 7,000 cases of marketable fruit this season, all of which he is shipping himself, preferring to risk the London market rather than sell at the price offered locally, i.e., 3/3 per case delivered loose at the packing sheds. He also stores varieties which he intends shipping later to the Sydney and Brisbane markets, when he expects to net about 10/ per case. The trees here are planted 10 ft. apart, and this is the rule observed in most of the older gardens. But new orchards are now laid out from 12 ft. to 1 rod between the trees. Owing to the prosperity of the apple industry land is almost unobtainable along the Huon. Land that could have been purchased 10 years ago at from 10/ to £2 per acre is now bringing £10 to £15. The flats are not considered suitable for orchards, as they retain too much moisture; but hillsides to the summit are utilised. The soil is mostly of a sharp black sandy nature, loose and friable, and is not reckoned second-class by comparison with the other lands of the State; but, providing a good clay subsoil exists, the settlers are satisfied with it for apple growing. Most of the virgin land is covered with heavy timber and thick undergrowth, and costs anything over £15 per acre to clear. The whole of it has to be grubbed out, and the timber is generally hauled into heaps and burn. Some of the land has also to be drained. The apples mostly grown for export are the Stronner, French Crab, New York Pippin (our Cleopatra), Adam's Pearmain, Scarlet Pearmain, and Ribstone.

Codlin Moth.

The codlin moth is not much in evidence about the Huon, although some gardens have it. The growers we visited on the south side of the Huon did not take it into consideration, stating they were able to keep it in check by picking off infected fruit and bandaging. They knew nothing about the arsenic spraying. During our week's stay in Tasmania we did not see a codlin moth or grub either in or out of the fruit. The moth does not appear to breed as many times as with us, owing, perhaps, to the more rigorous climate. The pest Tasmanians most feared was the mussel scale, but that has been overcome by spraying with an emulsion of red oil. Bordeaux mixture is also used for black spot.

A Remunerative Industry.

After leaving Mr. Shiels we called on Mr. Lomas, who was busy packing, as he had undertaken a contract to sell W. D. Peacock & Co. his apples for three years. Mr. Lomas was just casing up some very fine New York Pippins, of which he had had an especially good crop. The orchardists reckon the N.Y.P. as the best export apple they have, but it is not largely grown yet about the Huon. Mr. Lomas has three acres in full bearing, and averages from between 1,800 to 2,000 cases a year off this area. From 500 to 600 cases per acre seems the average crop about the district, and, although on first sight this appears an extraordinary crop, yet as they plant from 300 to 400 trees per acre, the one and a-half to two cases per tree is quite an ordinary yield. In fact, about the Watervale and Clare districts of South Australia four cases is only a moderate yield from a tree 10 to 12 years old, and on the Skilly, near Watervale, Mr. J. G. Williams has picked up to 17½ bushels of export apples from one tree. At 3/3 per bushel (the price Peacock and Co. are paying at their sheds), 500 bushels represents £80 per acre as a minimum return. Deduct £20 per acre, which should well cover working expenses, and £60 per acre represents a return that any amount of second-class land in South Australia, especially where a good rainfall is assured—i.e., Watervale, Clare, or Wirrabara districts—should return to small holders. Close to the wharf against Peacock's packing sheds an old man has been paid £150 for the appless on his two acres of orchard, and the buyer does the picking and packing.

Packing the Fruit.

The cost of cases is an item rather in favor of the Tasmanian grower, as these are mostly obtained near by from the sawmills at a cost of about 6d. each made up. They are solely constructed of stringybark and swamp gum, and are very heavy compared with the pine cases used in South Australia. The get up generally is not nearly as good as the South Australian cases. All the lettering is done with stencils, and has not the neat and business appearance of the printed case. In no instance, except for pears in half-cases, did we see any wood, wool, or paper shavings used in packing; simply the apple wrapped in paper and jammed into the case as fast as two hands can put it there. Should the apples be higher than the top of the case, the lid is nailed on and the apples forced down without any apparent thought of bruising. We were told that any bruise made on the apple when packing simply went hard and black, and did not injure the rest of the apple. It is only 12 to 14 years since apples have been systematically graded and packed here. The old style was to line the box with newspaper and tumble the apples in anyhow. Mr. Lomas told us he was one of the first to pack and grade in the present style. He won the first and for several years successively the £5/5 prizes offered by Messrs. Huddart, Parker, & Co. at the Launceston Show for best packed case of apples.

Export Trade.

Messrs. Peacock & Co. are the largest exporters of apples, and are looked upon as the pioneers of the export trade from Tasmania. They expect to ship themselves over 300,000 cases. They have packing sheds at various places in the apple centres, and are giving 3/3 per case for all sound fruit over the 2½ in. gauge. The packing and grading are done by men and women, who get 1d. per case, and an expert packer can do 100 cases per day; but the average is about 60 cases. All the cases that go back into the gardens are immersed in boiling water as soon as emptied at the packing shed, to guard against the possibility of carrying pests into the gardens. At Franklyn, a small town four miles from Huonville, Jones and Co., jammakers and apple exporters, have a large shed and evaporators for drying apples. They give 9d. to 1/ per bushel for clean rejects, and peel them by machinery and evaporate them. Unfortunately for us, when we were there the shed was not open. Steam launches ply daily up and down the Huon River, and during the apple season they carry a continual stream of apples into the Hobart wharfs. There are 20 to 30 landings and settlements along the river and up the channel, at which the launches call, and at all of which the apple industry is paramount. Our launch took 4,000 cases up. Apples intended for shipment to Sydney, Brisbane, and Interstate ports have to be fumigated. This is done with cyanide in the holds of the launches, and the brand of the Department of Agriculture is affixed, certifying to the fumigation. The boats charge ½d. per case for doing this, and 2d. per case is the freight from the Huon to Hobart.

Value of Land.

To illustrate the value of the land on the Huon, the captain pointed out a piece of 50 acres, having 8 acres of orchard, which was offered for £1,500 and withdrawn. Shortly after £2,500 was offered and refused for the same property. Near Geevestown Jetty an estate won by Mr. Stafford Bird in the Van Diemen's Land Bank lottery for £1 was pointed out. This land is now worth £10 to £15 per acre unimproved, and these prices obtain all along the river and channel. We had no lengthened opportunity to inspect the other apple-growing centres, but were informed that at near Glenora, up the Derwent, New Norfolk way, three estates would ship 120,000 cases of apples. Other land along the coast is being exploited for apple-growing. Jones & Company have planted 5,000 apple trees on the mainland, north of Maria Island, and they are expected to do well there. Young orchards are in evidence everywhere, but generally in small areas; the cost and time in preparing the land being a drawback. A man with 12 acres in bearing considers himself independent, and certainly the appearance of the orchardists met with gives an outsider such an impression. The purser on the steamship Huon said the sewing machine agent, photo. enlarger, and buggy maker were having a good time in the district. A well-kept orchard in bearing 15 to 20 years old is valued at from £120 to £150 per acre, and sometimes at £1 per tree. A short trip to New Norfolk and a later one to Port Esperance, calling at the Channel ports, fully confirmed our idea of the immense present and future capabilities of the apple industry and what it is doing for Tasmania. Apples and "Tattersall" have made it one of the best known States. During our week's stay five steamers loaded with nearly 120,000 cases, and the greatness of this number (and they expect to send away half a million cases before end of season) can only be realised when one stands on the wharf and views the sheds piled up 10 ft. high with tiers of cases of apples and the ocean tramps alongside the pier loading them by the score into their immense holds—the Medic took 45,000 cases—while daily, almost hourly, 10 to 15 steam launches unload from Channel and river ports from 1,000 to 4,000 cases each, and the trains run in an occasional truck load.

South Australia's Opportunity.

What apples have done and are doing for Tasmania they can also do for South Australia. We have unlimited areas of suitable apple land in good rainfall districts which is only now carrying a few sheep and cows. This can be got in the cleared state for what it costs in Tasmania unimproved. We have better facilities for handling the produce, if we except only the water carriage, and our apples are now commanding better prices at home than those from any other State, owing to better grading and packing. No return per acre, not even from currants—and these must have specially choice flats—can compare at the same cost with that from apples off second-class land. Provided that the codlin moth can be satisfactorily combated, and it has almost been demonstrated that spraying will give 90 per cent. of good fruit, we have a splendid industry only awaiting a little extra development, an industry that persons of slender means can embark in, with the knowledge that any money expended is almost sure to bring a competency in 10 to 15 years' time.

THE APPLE IN COLD STORAGE.

By G. H. Powell and S. H. Fulton.

Experiments have been conducted for two years in different apple-growing sections of the country to determine the best methods for harvesting and keeping apples in cold storage. About 180 varieties of apples taken from localities in Kansas, Missouri, Illinois, Michigan, West Virginia, North Carolina, Delaware, Maine, Massachusetts, and New York have been used in the investigation.

Preceding the detailed results of the experiments a discussion is given of the influence of cold storage on the apple industry, the function of cold storage, principles of mechanical refrigeration, and statistics of the extent of the cold-storage warehouse industry in this country. The specific problems investigated were the effect of the degree of maturity at harvesting time on the keeping quality of the fruit, the effects of delayed storage, and of storing at different temperatures. In addition, the influence of different kinds of packages, wrapping of fruit, soil, and cultural conditions, fruit from young rapidly growing trees and from old trees, &c., on the keeping qualities of the fruit in cold storage were investigated; as well as the effects of all the above factors on the development of apple scald during and after the removal from cold storage. The keeping qualities of about 180 varieties of apples used in the test are given in comparative notes.

As regards the best time to pick apples for storage, the results indicate that they should have reached full growth and high color before harvesting, but still be firm and hard when picked. Such fruit equals in keeping quality, and often surpasses, partially colored, or less mature fruit. It is superior to such fruit in flavor and texture, more attractive in appearance, more saleable, retains its flavor longer, and is less subject to apple scald. Overripe fruit deteriorates rapidly unless placed in cold storage soon after picking.

In experiments with some unusually large Tompkins King and Sutton apples picked from rapidly-growing young trees, the fruit that was but three-fourths colored kept much better than fully colored fruit. When examined in February fully colored Tompkins King showed 28 per cent. of physiological decay, while lighter-colored fruit from the same tree, picked and handled in the same manner, showed but 10 per cent. of decay. In another instance small, mature fruit from older slower-growing trees kept well until the middle of April; while the commercial limit of fruit from young rapid-growing trees in cold storage was sometimes three months shorter. Late varieties of fruits may be picked when they are beginning to mellow, provided they are handled with great care and stored immediately in a temperature of 31 to 32 deg. F. As a further protection, however, such fruit should be wrapped and stored in boxes.

As a means of securing better colored fruit, pruning to let sunlight into the tree is suggested. Cultivation and cover crops which tend to vigorous growth and lighter colored fruits may be withheld in part or the orchard seeded down until the desired condition is obtained. More uniform grades can be secured by picking trees over several times. This is especially desirable in the case of a specialist working up a fancy trade in apples.

Relative to the effects on keeping quality of delay in placing fruit after picking in cold storage, the authors found that when the weather at picking time was cool there was no apparent injury from delaying the storage of a large number of varieties of apples two weeks after they were picked. With warmer weather, however, a delay of two weeks seriously injured the keeping quality of the fruit. Rhode Island Greening, Tompkins King, and Sutton apples picked when the temperature averaged about 62 deg. F., and stored within three days, kept firm until the following March without rot or scald; while fruit from the same trees not stored until two weeks after picking was badly scalded or decayed by January 1. "None of the immediate stored fruit was scalded or decayed by the first of February, but the delayed Sutton and Rhode Island Greening apples were soft and mealy, and one-third were scalded at that time, while nearly 40 per cent. of the delayed Tompkins King were soft and worthless. The commercial value of these varieties was injured from 40 to 70 per cent. by the delay in storage."

Relative to different temperatures: "The investigations indicate that the ripening processes are delayed more in a temperature of 31 to 32 deg. F. than in 35 to 36 deg. F. The apple keeps longer in the lower temperature, it scalds less, the fruit rots and molds are retarded to a greater extent; while the quality, aroma, flavor, and other characteristics of the fruit are fully as good and when removed from storage it remains in good condition for a longer period." Some fruit when very carefully picked and handled kept very satisfactorily at the higher temperature, but for general commercial work a temperature not higher than 32 deg. F. is recommended.

A discussion is given of the physiological effects on apples in storage of freezing. The injury is seen in a more translucent appearance of the skin of the fruit, a water-logged and spongy condition of the flesh, and a brownish discoloration of the flesh. "In the practical handling of frozen stock the temperature should be raised very slowly until the frost is withdrawn. If possible, the fruit should not be moved until it is defrosted, as it discolors quickly wherever a slight bruise occurs or even where the skin is lightly rubbed. With these precautions observed it is often possible to defrost stock that is quite firmly frozen without apparent injury to it."

Wrapping fruit with tissue, parchment, or waxed paper or unprinted newspaper was found a valuable means of preserving apples. It appears to retard the ripening of the fruit and to preserve it from decay several weeks or months longer than unwrapped fruit. Thus, the amount of decayed fruit April 29, averaged 17.6 per cent. for 6 varieties when wrapped, and 41.7 per cent. when unwrapped. Wrapping also prevents the transfer of rot throughout the package, and protects the fruit from bruising and discoloration due to rough handling. A double wrapper proved more effective than a single wrapper. No important difference was noticeable in the efficiency of the different wrappers.

Closed packages for apples have been found most satisfactory. In ventilated packages the fruits are likely to shrivel if stored for any considerable time. Small packages cool quickest, and are, therefore, most satisfactory for delicate fruits or fruits in which it is desired to check the ripening process promptly. Cold storage fruit was not found to deteriorate more rapidly after removal from the storage house than other apples equally ripe. "Apples should be in a firm condition when taken from storage, and kept in a low temperature after removal. A high temperature hastens decomposition and develops scald."

The effect of cold storage on the development of apple scald was quite thoroughly investigated. The conclusions reached relative to this subject are as follows:—

"The scald is probably caused by a ferment or enzym which works most rapidly in a high temperature. Fruit picked before it is mature is more susceptible than highly colored, well-developed fruit. After the fruit is picked its susceptibility to scald increases as the ripening progresses. The ripening that takes place between the picking of the fruit and its storage makes it more susceptible to scald, and delay in storing the fruit in hot weather is particularly injurious. The fruit scalds least in a low temperature. On removal from storage late in the season the scald develops quickly, especially when the temperature is high. It does not appear practicable to treat the fruit with gases or other substances to prevent the scald. From the practical standpoint the scald may be prevented to the greatest extent by producing highly colored, well-developed fruit; by storing it as soon as it is picked in a temperature of 31 to 32 deg. F., by removing it from storage while it is still free from scald; and by holding it after removal in the coolest possible temperature."

TOBACCO.

M. Dybowski, who discovered that tobacco, manioc, potatoes, and bananas, generally supposed of American origin, grow in the region around Lake Tchad, West Africa, has been studying the African banana plants, and divides them into two distinct groups, one having a bare trunk or stem and bearing edible fruit (musa sapientium and musa sinensis); the other without edible fruit and merely an ornamental or foliage plant with leaves growing from the stem down to the ground (musa ensete). Those of the first group are Asiatic, yet they are represented in Upper Oubangi, and the mystery is how they got there. Those of the second group were known until of late by a single species, the banana of Abyssinia (musa ensete), often seen in hothouses and gardens abroad. The difference between this plant and the fruitbearing banana may have struck observant readers who have travelled. Apparently this plant is not found outside Abyssinia or East Africa, but one resembling it has lately been discovered in the whole of West Africa, where, since it yields a fruit different from that of the ordinary edible banana, the negroes regard it as a "fetish" or sacred, and religiously venerate it. According to M. Dybowski, it is a new species, which he calls musa religiosa, or fetish banana. Another and larger banana similar to it is the musa arnoldiana of Wildeman. These bananas have been successfully raised at the Jardin Colonial, Nogent-sur-Marne, France. They will grow in the open air under the climate of Paris, and they flower under glass. A fetish banana planted at Villefranche-sur-Mer, in the south of France, has flowered in 18 months. In fact, these new West African bananas are comparatively hardy, and may enrich European horticulture with a splendidly decorative plant. It is a fault of the banana hitherto cultivated for ornament that winds tear the leaves; but the new fetish banana resists even violent gales, as shown by Professor Boster in the Bulletin of the Society of Horticulture of Tuscany.

WATERING UNDER THE SOIL.

The Ohio Experiment Station has been trying the value of "sub-irrigation" in the greenhouse. The idea of irrigating the soil below the surface arose out of an attempt to prevent the wetting of lettuce by not wetting the foliage. It is cheaper than the old method of surface watering; the soil remains in a better condition, and the plants are less apt to decay. These advantages come from the soil permitting the air to pass freely through it, besides supplying water constantly to the roots. Full particulars of the new system, with drawings of the construction of the greenhouse, are given in a recent bulletin of the Ohio Experiment Station. Lettuces grown in the new way are double the size of those grown in the old way.

BOY GARDENERS.

Interesting experiments in gardening are being carried out at two Norwich Board Schools. At one a number of boys are rearing, each on his plot, crops of vegetables. They are managing it so well that "a profit of £2 has been made." For boys from the second school the corporation has granted a strip of ground sixty yards by thirty in the Chapel Field public gardens. Here these boys are cultivating flowers.

A Musical Education for Half=a=crown.

The above heading will, of course, appear to most people as the height of absurdity; yet the absurdity is more apparent than real. It goes without saying that a finished musical education in the regular course cannot be had for half-a-crown, or even with several hundred additional half-crowns; but can it be truthfully said that the person with a sufficient knowledge of music to play accompaniments on the piano or organ, to all the popular songs of the day, has no musical education? Assuredly not. A musical education, sufficient to enable one to play accompaniments to the home frequently, gets and gives more pleasure from the modest accomplishment than does many on whose education large sums have been expended.

To the more modest musical education the above heading applies. Such an education "The Australian Gardener" is now offering its music-loving readers for half-a-crown, believing that it is the greatest benefit we can give our subscribers.

This ready-made musical education consists of Pratt's Chart of Chords for the piano and organ, which is the nearest approach to the ready-made knowledge of music yet attained by science.

It is a short cut to harmony, and is to music what the multiplication table is to arithmetic, a quick method of learning to play the piano or organ without a teacher.

With this chart any one can, with but a small amonnt of practice, become an expert pianist. It is a complete self instructor, enabling any one to play the piano or organ at sight, and to play, without difficulty, brilliant accompaniments to any song ever written. It is valuable to the advanced musician as well as the beginner, embracing nearly every major and minor chord used in music; and is endorsed by teachers and musicians everywhere.

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Believing that the educational value of this Chart cannot be over-estimated, "The Australian Gardener" has arranged with the publishers to supply Pratt's Chart of Chords (pnblished at 5s.) to its readers at the reduced price of 2s. 6d. each, with 2d. added for postage, and in addition to the Chart of Chords the publishers have kindly agreed to send without extra charge a copy of the Coronation Musical Folio, containing 48 pages of sheet music, and instrumental by popular composers.

Every home that has a piano or organ, especially where there are children, should have Pratt's Chart of Chords.

This offer is made for a short time only, and "The Australian Gardener" readers should avail themselves of it without delay.

Address—"THE AUSTRALIAN GARDENER," Adelaide.

The Australian Gardener

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Answers to Correspondents

"J.W.R."—The name of the shrub you should have been supplied with is Protea coccinea.

"Fever."—By no means place the flowers of bulbs in a sick room. They all contain poisonous elements.

"Effie."—The creeper you admire so much is Mina Lobata. It certainly is one of the most effective. It blooms profusely for months.

"New Rose."—Wo cannot tell you. There are so many hundreds of Roses that a list could hardly be made. When making your choice do not forget the old favorites. You cannot go far wrong with them.

"Stock."—Ask for Briar Stocks for your Roses.

"Shade."—The quickest growing Rose for a trellis is perhaps the Crimson Rambler.

The Flower Garden

OPERATIONS FOR JUNE.

Work in the garden for June is practically a continuation of last month. It is a good thing to remodel beds. The operation gives additional charm to the garden, to lady gardeners particularly. Like the charm of a lady's drawing-room is chiefly found in shifting round the furniture and ornamentation, the same fancy extended to the front garden gives it a newness and pleasure. The operation may not necessarily be extensive or complete. A path narrowed here and widened there, with a straight line or a curve introduced, a bed chopped off at the corners, or lengthened or widened according to position make a combination of effects that will be interesting and satisfying even if they are not really an improvement.

The same argument applies to the contents of the beds. Generally speaking a number of old plants get a little ragged and unkempt. If these are cut out, or dug out altogether, and something new put in their place the change will be greatly appreciated. However affectionate one may get towards a particular plant the removal of it varies what may bocome a monotony, and this can wisely be put aside by shifting it to another place, and something equally pretty and fanciful substituted.

If remodelling is undertaken opportunity should be made to thoroughly replenish the soil with manure and the leaf scrapings from the backyard which will have been heaped up, or, better still, pitched into a pit. Cart it out in the wheelbarrow, and spread it over the beds with the manure and turn it all in with a good depth of the spade. Give the top soil a nice raking to fine tilth and the result will be satisfactory.

Perennials, biennials, and annuals can be planted out, and do not dab them in anyhow and anywhere. A little effort at designing a garden bed will give a hundredfold satisfaction. Just bear in mind that some little seedlings will grow to two or three feet high when they are to bloom, while others that are equally small as seedlings will not grow more than a few inches to their flowering height. Remember also the coloring of the blooms. Natural colors s a rule harmonise pretty easily it is true, but a little forethought will be of material assistance, and the result give more satisfaction.

In selecting your plants go to your nurseryman personally if you can. He will always be pleased to see you, and you will be surprised to find what a pleasant agreeable gentleman he is. He will tell you all you want to know, and a great deal more, for that matter. Amongst your choice of bulbs do not forget a few Tulips. Put them in a sheltered spot, and if you succeed in getting a good strain you will thank "The Australian Gardener" a hundred times for mentioning it. Lift all you can and divide the plants. This is the month to begin pruning Roses. One lesson from a practical man would greatly help amateurs.

THE OLD-FASHIONED GARDEN WHEN SUMMER WANES.

There are many winding pathways in the old-fashioned garden. The long borders that meet these pathways run back in many places to a background of flowering and other shrubs. Now it is easy enough to find flowering subjects for spring and early summer, but later than that the task is more difficult. But in this old garden, where flowering shrubs are so great a feature, a careful selection has been made of these later-flowering varieties.

Spiræa Bumaldi takes the place of honor, and is represented by a goodly number of specimens. This shrub comes to us from Japan; it commences to flower in July, and continues to blossom for a considerable period. The pink flowers suffer little from the weather, or from heavy storms. In habit of growth it is very effective, and of great value from a decorative point of view. This is to say, it is a dense, dwarf shrub, with blossoms from the topmost twig to within a few inches of the ground. I think that I may well say that of all our late summer-flowering shrubs there is none so worthy a good position in our gardens as this.

Few people have words of praise for the familiar Privet; but, then, few people are familiar with one variety of this summer-flowering shrub that, while in blossom, is nothing short of beautiful. From amid the bright green leaves appear huge loose bunches of feathery white flowers of most graceful and dainty appearance, so that one hardly regards it as a Privet at all, but rather as some unknown and truly beautiful summer shrub. The Lavender also may be classed as one of these late-flowering shrubs, for plants of this old favorite become in time of generous proportions. In this old garden it grows in long and formal lines at the summit of a terrace slope, and, in fact, hedges in a croquet lawn. Does not such a position for sweet Lavender commend itself to you, reader? Here, in the intervals of the game, we can enjoy the sweet old-world scent, and how infinitely more in keeping is a delightful subject such as this than, say, a line of Laurel or Berberis.

I have discovered that it is difficult indeed to find a man or woman who has not, in the depths of his or her heart, a feeling of sentiment, not unmixed with affection, for Lavender; and this long, unbroken line, when covered with its thousands of violet spikes, and shedding its perfume on every side, evokes more exclamations of approval and admiration than anything else that the old garden may contain.

Lavender may be so quickly established. Large pieces broken off and planted rather deeply in the ground root with great certainty, and good-sized flowering plants are thus obtained by the following summer. Being perfectly hardy they need no attention through the winter, provided the cuttings are planted firmly enough not to be loosened by winter frosts.

There is one plant that no old-fashioned garden can afford to be without. It need not have a very prominent position, but somewhere out in the sunshine the grand, upright stems of some well-grown Mulleins should appear. I am aware that the generality of gardeners, if they find a place at all for this old-fashioned plant, are content to place it in some out-of-the-way and half over-grown corner. Plants in such a position cannot compare with those put into good, well-worked soil, where sun and air can circulate about them. I well remember a wide edging of the tiny dwarf Veronica rupestris, out of which, by accident, there grew the noble rods of the largest Mullein I ever saw. It was suffered to stay, not one year only, but three or four, and each season became a thing of beauty. The Mulleins blossom after the Foxgloves have gone, and, as in leaf and in habit of growth, there is considerable resemblance between the two, it seems to me that, on that account alone, they should find a welcome, as they come in a happy and delightful sequence.

August and Hollyhocks—the two are inseparable, and we may well tell ourselves that we can never enjoy August to the full unless we have had a glimpse of these August flowers. Here, in this old garden, they are held in high favor. They grow in front of an old stone wall, and face the south, not two or three only, but more like sixty or seventy. There cannot be too many of these most glorious of summer flowers. They are homely flowers, it is true, for the Hollyhock makes no claim to appearing as a particularly high type of plant. But, for all that, there is not a garden in the land in which the Hollyhock could be thought out of place. No other plant gives us rods of 8 or 10 ft. of gleaming crimson, and pink, and flesh color, of dazzling white and clear sulphur-yellow. Double Hollyhocks last so much longer than the single. There is so much more body of color, and they are quite as, if not more, beautiful than the single varieties. I cannot help thinking that the double kinds have a look of higher cultivation than the single, and are, therefore, more to be desired.

These Hollyhocks have come to us from Southern Europe, and some from China. The sight of these grand plants, growing wild on their native slopes, must be a sight to treasure for a lifetime. They require good rich soil, and a top dressing of short manure when a summer drought sets in. We are miserly indeed if we would grudge good food to these most generous of plants; for to induce them to give us a good display goes far to furnish our gardens in late summer with an abundance of bright and acceptable color.

Many people show an especial pride when they can point to a particularly dark-colored specimen. But whatever these may say, there is not the same subtle charm about the very dark specimens, for the sun does not shine through them with that intense and half-transparent effect that it does on the lighter and brighter-toned pink, rose, and crimson hues.

The Erigeron speciosus, that was in flower before June was out, is still covered with pale mauve blossoms, and is one of the most refreshing and restful bits of color in this old-fashioned garden. It is growing in front of some of the pale pink Hollyhocks, and there presents a combination of coloring that is very charming and somewhat uncommon.

This Erigeron is worthy of a little extra care when staking. It is particularly limp as far as the stems are concerned, and large clumps of it badly and tightly tied to a stake do not give any idea of the real beauty of this old garden favorite. It should never be allowed to grow tall and straggling before being attended to. Early in the season the clumps, which should be of moderate size only, should be neatly tied out. Each clump needs three stakes at least. As time goes on, and the length and weight of the flowering stems increase, ties will be necessary higher up the stems. The work must be carefully done, so that the character of the plant is not lost. If well done, the stakes need not be at all apparent. They may, in fact, be completely disguised, and in all cases they must be near together, that the plant may not become unshapely.

As the Roses were the glory of July, so are the Carnations the glory of August. Carnations are never so delightful as when growing in long narrow beds, beds if possible cut in the grass, so that the richly colored blossoms are silhouetted on the green. There is a great fascination in growing Carnations from seed. In these days we may well hope for success, for the seed is much more reliable than it used to be.

In this old-fashioned garden there are several of these long narrow borders of Carnations. Sometimes the colors are mixed, but always one border is reserved for the old clove-scented crimson. I may say that every autumn much of the old soil is removed from these borders, and fresh brought in to take its place. In this way Carnations can be grown in the same position year after year.

Other plants that are now making beautiful this old-fashioned garden are the Potentillas, the earliest Starworts, perennial Sunflowers, Evening Primroses, Dahlias, and Everlasting Peas.

Over the arches that span most of the long straight walks, there is now a wealth of purple Clematis. There is one long walk that has twenty of these flower-clad arches. The path itself is very wide, and the arches give to it a charming quaint and formal look when spanning it in such numbers. The effect is particularly delightful when standing at one end, and getting a narrowing vista down the entire length. It is beautiful at all times, but now, when every arch is covered with its wealth of richly toned Clematis, it is difficult to say how beautiful, and the wonder is that more garden lovers do not make use of such simple means of gaining a similarly quaint and delightful effect.

F. M. Wells.

A dressing of lime applied to many old gardens would be the best manure that could be given.

HERBACEOUS PLANTS ON GRASS.

Many species belonging to this class of hardy plants would create a much finer effect if grown singly or in bold clumps on the grass, where they could obtain more freedom for both foliage and flower alike than they very often receive now, huddled together in a much too narrow border, where the true character of the plant is altogether obscured. Besides, a feature in the garden might be very easily added, which would give increased interest. If such an idea were more generally carried out and the grass kept short the plants would give even a finer effect than they do now where employed in the wild garden, where it is necessary to allow the grass to run to keep up the true character of that part of the garden. Many of our finest herbaceous plants are remarkable as much for their foliage as for the flower itself; long grass would altogether spoil the effect. In that case, therefore, grass which is kept short is preferable under the above conditions. How the plants shall be arranged is more of matter for personal taste than for minute instructions in this article. This section of hardy plants prefers liberal treatment, and for it give a good return. A firm, holding soil is more suitable for the general body of these plants than a light sandy one, although some few may need a little attention to give the best results. The stations where all are to be planted should be deeply trenched; if the soil is poor, some partly decomposed farmyard manure and old potting soil ought to be added, and will well repay the extra labor incurred in giving a more luxuriant growth, which means an enhanced appearance. All the plants here mentioned are the better for copious soakings of water at the roots if the weather be hot and dry during the summer months. Some of the species have not sufficient foliage near their base to hide the soil in which they are growing. This might be improved by covering the surface soil with some of the many low-growing hardy plants, such as Sedum glaucum and S. Lydium, Herniaria glabra, Arenaria tomentosa, or Veronica repens, all of which are of quick growth and of suitable colors to form an agreeable contrast with the plants above.

Telekia speciosissima, or, as some prefer to call it, Buphthalmum, is a capital subject for growing on grass. The habit of the plant is vigorous, having large drooping leaves, which cannot be seen when surrounded by other things in the herbaceous border. Stout flower-spikes 4 feet long are freely produced, having blooms much resembling Japanese Anemone Chrysanthemums in their formation; the color is orange-yellow.

Polygonum cuspidatum is just the plant for this purpose; the growth has an outward tendency, deep green; the drooping, feathery, panicle-like flowers are creamy-white, freely produced. If larger growth is required, P. sachalinense may be planted, which will quickly run up 10 feet high. The former variety does not grow more than 5 feet high.

Bocconia cordata, commonly called the Plume Poppy, if planted in a bold clump would give a noble effect, growing, as it does, from 6 to 8 feet high. The glaucus color of the underside of the leaves gives it more variety. The flower-spikes from strong roots are fully 3 feet long, creamy-white in color.

Fuchsias of the Riccartoni, microphylla macrostemma, and fulgens types are excellent subjects for growing on the grass. Well-shaped bushes upwards of 8 feet in diameter can be quickly obtained. In this way this class of Fuchsia is seen to the greatest advantage. The bulk of the varieties flowers profusely the whole of the summer, and they are amongst the easiest plants to increase; the wonder is they are not more cultivated than at present. Rarely are they seen beyond cottage gardens if one excepts botanical collections of hardy plants.

Acanthus mollis and A. spinosissimus, commonly called Bear's-breech, are very suitable for growing on grass. The foliage is broad, deeply laciniated; they have white and purple flowers and grow about a yard high.

Actæa spicata (Baneberry) would give extended variety if planted in conjunction with other things named. The foliage is bold, and the numerous flower-spikes which strong plants freely throw up have a good effect, so uncommon are they in form.

Tritoma glaucescens and T. Uvaria are second to none for this method of garden ornamentation; the bright orange and red of the flower-heads make an agreeable contrast with the deep green of the foliage and the grass. T. glaucescens opens its flowers first, and they are more freely produced than those of the older Uvaria, of which it is a form, and a good one, too, for extending the flowering season of these showy Flame-flowers.

Eryngiums would be useful to extend the flowering season, and their bright-blue flowers are at all times appreciated. The small flowered amethystinum is free; therefore worth a place. The deeper-colored and stronger-growing Oliverianum is perhaps the best of the genus.

Inula macrophylla and Inula glandulosa would be quite at home on the grass, their deep orange-colored flowers contrasting so well with the grass.

Montbretia Pottsi and the newer crocosmiæflora are well suited to this form of culture; the semi-drooping habit of the narrow leaves fits them well for growing on grass; the orange and red flowers, too, are freely produced and pleasing.

Solomon's Seal (Polygonatum multiflorum majus) is another hardy plant well suited to this form of culture; in good soil the stems increase in strength annually, and produce a greater profusion of the peculiarly colored greenish flowers, which are very sweet-scented; the berries, which are afterwards produced in quantity, render this plant still more interesting.

Spiræa Aruncus (the large Goat's-beard) has handsome foliage and showy, graceful, drooping plumes of almost white flowers—certainly a desirable plant for growing on grass.

This list does not by any means exhaust the stock of suitable plants for this form of hardy gardening, but has been given to afford a general idea of a plan which cannot fail to prove interesting.

LILIUM LONGIFLORUM INSULARE.

Without showing any marked divergence from the normal form, varieted names have been plentifully showered upon the varieties, or supposed varieties, of Lilium longiflorum, one of the latest being that at the head of this note. As flowered from imported bulbs, it is certainly full of promise, for the growth is sturdy and robust, two or three stems being often pushed up from one bulb, while the flowers, of which several are borne on a stem, are unusually expanded, and of a thick wax-like substance. Taking an isolated flower, one is reminded of a particularly good form of the Japanese variety Wilsoni. The name of insulare is but a garden appellation, having its origin in the fact that it was imported by a well-known firm of nurserymen from an island in the Pacific Ocean, where, judging by results, it has found a congenial home. Whether this will prove to be a geographical form, whose points of difference will disappear under cultivation, remains to be seen, for when Lilium longiflorum Harrisi was sent from Bermuda many features from which it differed from any other longiflorum were claimed for it, yet, after a season or two in this country, all these points vanished. Whatever a further acquaintance may lead to, there is no question that these imported bulbs represent one of the best forms of Lilium longiflorum, particulaly for a cool-house, or for growing out of doors. Of the bulbs which flower in this country we draw our supplies from Japan, Holland, Bermuda, and South Africa, as well as from the Pacific Islands.

——L. longiflorum (or Harrisi) var. insulare is very free-blooming. Three bulbs sent up seven stems about 2½ feet high, which bore 29 beautiful flowers.—"Gardening Illustrated."

CARNATIONS.

The great Carnation raisers have hosts of humble imitators all over the kingdom, men and women to whom Dianthus caryophyllus is very dear, who cultivate it in preference to other plants, and have studied its requirements most lovingly. Such growers as these find out many secrets; indeed, it would be strange if they did not manage to grow healthy plants and charming flowers, since, in floriculture, as in all other pursuits, love for the efforts as well as for the results is certain to achieve triumphs.

The Carnation was "a florist's flower" thirty years ago, and immense improvements in it have been effected since then. A book about gardening, published in 1864, contains the following passages about the Carnation:—"Another florist's flower, which would occupy all the remaining space in this book, if allowed." For what it must be, as an exhibition flower, see Glenny's 'Properties.' Of the Picotee, this gentleman pronounces: 'The properties of form are similar to those of the Carnation; but the distinction between Carnations and Picotees is that the color of the former is disposed in unequal stripes going from the centre to the outer edges, and that of the Picotees is disposed on the outer edges of the petals, and radiates inwards, and the more uniformly this is disposed, the better. The choicest varieties of both these flowers are named, and new ones, raised from seed, are constantly appearing in the nurseryman's advertisements.

"The wild Carnation, like several other species of Dianthus or Pink, is found growing luxuriantly on the tops of walls and similar arid spots. In the South of Europe the garden Carnation is treated accordingly, and delights the casual passenger by displaying pendent heads of flowers in unlooked-for sites. The fact gives a hint in respect to culture; Carnations are injured by too much moisture. In beds they are usually grown in light, rich mould, composed of calcareous loam, silver sand, leaf mould, and rotten cow dung. A lady betrayed the secret of her great success with Carnations by setting her foot on the bed, wherein it sank ankle-deep. Perhaps the good drainage thereby insured was literally at the bottom of her triumphs, for pot Carnations have mostly the earth pressed firmly about them. Propagate, and also maintain the excellence of, good kinds, by layering every year after the flowering season. Make a slight slit in the underside of the shoot, at the point where it will be imbedded in the earth, immediately below a joint or bud. Keep the slit open with a small slip of wood, peg the layer down with a small hooked stick, and cover it with light earth." I have quoted the above instruction because modern Carnation fanciers cannot fail to be considerably amused by them. Let us note one or two of the quaintest points.

The description of the Picotee given by Glenny is somewhat different to the concise scientific description given to-day, which runs thus: "Picotee: Ground color of one shade, edged with another color."

The notion of growing the garden Carnation on the tops of walls, to supply "pendent heads of flowers in unlooked-for sites" to delight "the casual passenger," is surely enough to provoke the rage of the Carnation enthusiast. The hint as to the necessity of good drainage may be taken, without our imitating the lady whose foot sank ankle deep in the flower-bed. Lastly, it would be interesting to learn the percentage of failures in the layering of carnations by that method of "keeping the slit open by a small slip of wood."

A modern, excellent little work on the Carnation tells us that a "Flora," published in 1702, gave a list of no less than three hundred and sixty varieties of the "July" or "Gilli-flower," most of which were of Dutch origin, and stated the usual price of a good layer of a named kind was twelve pence, and that though the Dutch and Flemish growers were able to raise such fine varieties from seed, it could not be done in this country, as the plants raised from such seed as could be procured here produced, as a rule, only single or imperfect blossoms.

Growing seedling Carnations is, I think, one of the most fascinating of all floricultural pursuits. What an excitement it is when the new young plant begins to form "fat" buds, and how eagerly do we watch for the first colour streak! We love the plants all the more becuse we have had to cherish them during a whole year of, what non-enthusiasts might call, uninteresting babyhood!

Seedlings that are raised later than May ought to be wintered in a frame, because though they may stand the winter all right out in the open, the cold will probably check their healthy development, whereas in frames they can keep on growing.

Seedlings, too, bloom more freely than do plants from layers, and are seldom attacked by disease or wireworms. There are few flowers that are so well adapted for growing as a hobby by the humbler gardener, for even the choicest seed is cheap, considering how many really splendid plants may result from sowing it. I advise gardeners to write, as coaxingly as they know how, to some of the noted raisers of Carnations, enclosing postal-orders, of course, but asking for "specially good seed." There is a spirit of comradeship among all Carnation lovers that may cause the great cultivator to spare a few of his best seeds to the amateur grower. I only say "*may* cause," it will be noticed, but the seed offered by Carnation specialists is certain to be satisfactory.'

Of course, it is more scientific to purchase plants of named varieties, hand-hybridise one's own seed, making promising crosses, and thus set about obtaining kinds that shall be fit for cataloguing. Colour, markings, and form must all be excellent before a Carnation is worth naming; the petals ought to be thick, shell-like, evenly set in the flower, and have rounded outlines. Then the pods, or calyxes, ought not to split, and the habit of the plant should be satisfactory.

But what a woeful circumstance it is when, having at last raised what seems likely to be a Carnation worth a position in the market, that same Carnation refuses to form any shoots that can be layered.

Truly the Carnation-growing hobby is a delightful one, full of excitements and possibilities.

Hobby Gardener.

JAPANESE PINKS.

This race of most beautiful garden biennials also enjoys the name of "Flower of the Gods," which it well deserves, when the elegant forms and splendid colouring of the blooms are taken into consideration.

Amateur gardeners have, apparently, overlooked these easily-grown Pinks, as they do not appear to be often made use of for bedding purposes. Yet for this alone—to say nothing of their suitability when cut for bouquets and room decoration—they are really indispensable.

For richness and variety of colouring Japanese Pinks are hard to beat. The flowers are large and beautifully tinted, ranging from white through various shades to the deepest and richest of crimsons.

Although they are biennials, yet, if the seed is sown in heat, in February, the plants will flower during the summer.

A packet of seeds of the best mixed colours should be obtained, and it will be an endless source of pleasure to the grower to watch the development of the plants and the slowly-expanding blossoms. Sometimes in these mixed seedlings one comes across a novelty, either in shape or colouring, which would be worth keeping.

To those who possess sandy or clay soils, the Dianthus should specially appeal, as, even if planted in the full glare of the sun (in which they delight), their needs as regards watering, or any other attention, are very small. In fact, these handsome plants might be appropriately named the "Lazy Gardener's Flowers."

As to cultivation, the time for early sowing in heat, to get the plants to bloom the same year, has already long since gone by. The best time for sowing in the open garden is the end of June or the commencement of July. Choose a nice open position for the seed-bed, and make the drills about one inch deep and six inches apart, then fill the drills about level with the surface of the ground with finely-sifted soil. Next sow the seeds thinly, and lightly sift a little more soil over them. An important point is to shade the bed during germination, and then gradually accustom the seedlings to the full sunshine.

If all goes on well, the young Pinks should be ready to place in their permanent quarters during August. But should the beds which they are to occupy not be ready, the plants had better be transplanted to another part of the garden, as if the Pinks become crowded in the nursery bed they are liable to become lanky, sappy, and ungainly in form, instead of short, sturdy, and compact plants, which can the more readily survive the rigour of an English winter.

There are other varieties of these most beautiful biennials, viz., the Chinese and Indian Pinks, both of which are very similar in character, and the same treatment as recommended for the Japanese section will suit these also.

Should any reader desire to grow the named varieties, he will find the following about the best of the Japanese Pinks:—Crimson Belle, with large flowers of a splendid crimson; Eastern Queen, with large and handsome rose-coloured blossoms; Empress, with attractive flowers of a vivid crimson; and the Bride, a good white with pink centre. All these Pinks have been so much improved during the last few years by our English florists and growers, that I fancy they will, in the future, usurp the position of our old-fashioned garden Pinks. [No! Ed.] The average height is one foot, and, as a rule, they will be found to come very true from seed.

E. H. Potter.

CARNATION CUTTINGS.

The only really quick and certain way of treating cuttings in the open is as follows: "From any large tuft that contains many growths that could not be layered in time, let anyone take and strip off from the parent plant, each with a heel attached, as many pieces as are required. Taking the growth in the thumb and forefinger of the right hand, and giving a slight, yet sharp, downward pull, the piece will come away with a perfect heel almost every time. Now make a little trench as though setting a Box edging, and so deep as to admit the so-called cuttings being buried up to the leafy tuft, and insert them without trimming, stem-splitting, or stone wedges. A little pure sand or very sandy soil may be put in each trench at option, and may depend on the nature of the soil. There is, however, no need for any prepared bed of soil at all. As the cuttings are placed in the trench, and while held in position by the left hand, draw sufficient soil with the right hand to keep them fairly erect, and, finally, finish off with the spade while also preparing a second trench. A good gentle tread with the foot when the trench is two-thirds filled with soil is a necessity. Not only is this a quick way, but a way also that ensures cuttings of the size of layers, and quite large enough for spring planting. By this means several hundred may be inserted in an hour.

CARNATIONS BURSTING.

The cause is chiefly with the variety, and is due in some measure to the shortness of calyx, the more or less bluntness of the calyx at the apex, and the great number of petals in the flower. Varieties with fewer petals and a longer, more uniformly-sized calyx are much more free from this bursting of the calyx. No culture can remedy it, but it is made worse by disbudding, which naturally gives greater force to the flower buds that remain.

BOUVARDIAS.

Planting out can be practised by those who do not care to be troubled with the labor involved by pot culture. Lifted carefully in early autumn and put into pots just large enough to contain the roots, they will bloom all through the late autumn and early winter months. When Bouvardias are grown in pots all through the season they must have skilful treatment and a lot of attention—more than most amateurs are able to give them; but planting out in suitable soil at the right time is sure to give good results. The best way is to set them out in frames, as in this way several weeks are gained, and one can make sure that the young growths are not checked by spring frosts. The soil should be nice and free, with a little well-rotted manure or some concentrated manure in it.—J. C. B.

ROSES.

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NOTES ON ROSES.

The planting season is rapidly approaching once more, and it is now by no means too soon to consider what we shall plant in the forthcoming autumn, or even to commence the selection and preparation of the ground, or sites, for our plants.

Those who are wise will have visited the various exhibitions of this ever-popular flower, held in different parts of the country, and, at any rate, some of the nurseries where the Rose is cultivated on a more or less extensive scale, making notes of the best of the newer introductions, or of any of the older kinds that they may not already possess, with a list of all they would like to add to their collections, according to the space at disposal. Some even go so far as to visit the nursery at the present time, or a little later, and select their own plants, but this is scarcely necessary—except, perhaps, in the case of plants for special purposes—but an important point is always to "order early," as it appears to be an invariable rule among nurserymen that those who come first should be served best.

I am always a strong advocate for early planting also, in the case of Roses, or almost anything else. Especially where the soil is of at all a heavy or damp (and consequently cold) character, it is much better to get the planting of anything of the kind done early, while the ground still retains a good deal of latent warmth, than to wait until later, when the frost or cold rains, &c., have reduced its temperature to a much lower point, and such soils are consequently damp, cold, and "sad." A gentle warmth in the ground, at or below the roots, is a great aid to the formation of plenty of fresh feeding fibres, and when this takes place before the winter sets in the plants will seldom fail to start into a very vigorous and healthy growth in the spring, even when the top growth, or branches, are cut back to some extent by severe frost, &c., during the winter.

The character of the season makes a good deal of difference in the right or best time for planting, of course, and the nature of the soil, as well as the local climate, &c., must also be taken into consideration, but what should be aimed at, principally, is to get the plants in when the soil is in such a state as to afford a gentle warmth about their roots, while the tops are comparatively cool, and evaporation is not too active. Never plant, if it can be avoided, when the soil is either very, or even really, wet, nor yet so dry as to have lost some slight degree of adhesiveness. A supply of dry, and rather fine, soil, of good quality, is often of the greatest use when planting in a too damp or coarse staple—for this purpose old potting soil, leaf mould, road sidings, &c., are all suitable, but if the weather is wet this should be stored under cover until required.

It "goes without saying," of course, that the ground, or sites, for the plants, must be deeply trenched and well manured before getting them in place, and it is scarcely too soon to commence this work even now. Where the soil is light and dry use plenty of good, "fat" farmyard or cow manure; but if heavy or clayey let the material used be of a comparatively light and strawy or flaky character. The drainage should be sufficient, but by no means excessive.

Finish repotting any Roses in this form that require it, and when those first attended to are found to have rooted through to the sides of the pots rather more water should be given, but do not overdo it. Thrifty young plants are frequently lifted from the ground and potted, and this method is somewhat less costly than purchasing the usual pot plants, but a month hence will be time enough for the operation.

ROSARIAN.

ROSES UNDER GLASS.

Where Roses are grown in cold houses or in those only moderately heated it is quite time to see about pruning the plants. Should they be just received from the nurseryman they are, as a rule, thoroughly ripened and the pots full of roots. It is always advisable with such plants to remove about an inch of the surface soil, replacing this with a little new compost consisting of good loam and well-rotted manure in about equal proportions. Remove all sticks and prune the growths back to good plump eyes. Something depends upon one's object as to how the pruning should be done. If we desire to form them into specimens with a view to exhibiting say next year, rather hard pruning must be resorted to, the ripe stout growths cut back to four or five eyes, and, if possible, with the top eye on each shoot facing outward. A good start is thus made towards forming a shapely plant. Where quantity instead of quality is desired, then a much more moderate pruning will suffice. In all cases keep the centre of the plant open. This can be assisted by careful tying out. As soon as the pruning is completed tie a piece of string beneath the rim of the pot, then bring down the growths slightly by means of a piece of twisted raffia secured to the shoot and string beneath the rim. When thus prepared put the plants upon inverted pots and bring them as near the light as practicable. No water will be needed at the root until new shoots have pushed about half an inch, then it is advisable to give a good soaking, repeating the watering in two consecutive mornings, but prior to this the plants should be syringed with cold water every fine morning immediately after pruning. Abundance of air must be afforded from the commencement. If this is adhered to mildew troubles will be minimised. When cutting east winds prevail, the side air should be shut off from the side whence they come. I prefer to keep a crack of air at the top on nearly every night, the exceptions being during frosty weather Even then, when artificial heat can be given, a buoyant atmosphere is preferable to a stuffy one. What Roses do not like is a check of any kind. A uniform system of treatment is the one that leads to success.

Where one can divert one house or more entirely to Roses success is almost assured, but the Hybrid Perpetuals do not go well with the Tea-scented, the latter requiring a higher temperature. Such of the Hybrid Teas as approach the Teas in habit can be grown with the latter, and these—such as Captain Christy—having more of the Hybrid Perpetual nature, should be grown with the Hybrid Perpetuals. Crimson Rambler grown in pots pays for a sprinkling of some good artificial manure at the time of pruning, taking care to well water it in. Another application is given when the buds commence to swell. This is a Rose in which the grower's skill is made very manifest. Splendid trusses, well-colored, are quite possible from young plants if the above practice be adopted. Old specimens should be relieved of a lot of their worn-out wood. The one and two-year-old shoots give the best quality of blossom. These Roses, and others of the same ilk, such as Dorothy Perkins, are invaluable for decoration. If their long shoots are twined around three bamboo canes they make beautiful objects for recesses and similar positions, and last a long time in flower. Being much addicted to red spider the syringe must be freely plied, directing the water well beneath, not above, the foliage. Yellowish looking leaves, if examined with a magnifying-glass, will be found to be covered with red spider beneath.

In preparing a selection of pot Roses do not omit the pretty little Polyanthas, Perle d'Or, Eugenie Lamesch, Gloire des Polyantha, Schneewitchen, etc. They group beautifully with the Crimson Rambler. Small plants even in 5-inch pots come in most useful for this purpose, or as table plants. So also do the Monthly Roses, Queen Mab, Laurette Messimy, Aurore, Cora, Cramoisie Superieure, Fabvier, Little Pet, etc. In large gardens Pillar Roses and standards in pots give the gardener much valuable material for the conservatory, and the fragrant Penzance Briers and other single kinds have a beauty all their own.—"Gardening Illustrated."

ROSES FOR FENCE.

A good crimson variety would be Ards Rover or Ulrich Brunner, and for a white flesh-tinted one you could not plant a more beautiful Rose than Mme. Alfred Carrière. The best time to plant is early in June.

ROSE OF SHARON.

When selecting a list of shrubs do not omit to include a Rose of Sharon, the common Althæa. In addition to its beauty, it merits a place because of its summer-blooming qualities. It is a midsummer and autumn bloomer, cheering us at a time when hardly a shrub of another kind is in flower. There seems to be a prevailing impression that a pure white double sort is a myth. There is more than one of such a kind. Joan of Arc is pure white, and there are others.

CLIMBERS FOR ARCHES.

Vigorous climbing or rambling plants suitable to cover rustic arches and summer houses are: Virginian Creeper, Celastrus scandens, the stronger growing Clematises, such as Flammula, Montana, and Vitalba, Honeysuckles, Lycium barbarum, Cut-leaved Grape-Vine, Wistaria sinensis, Forsythia suspensa, white Jasmine, and above all some of the more vigorous and free-flowering climbing Roses.

FUCHSIAS.

The Fuchsia is one of the most popular plants in cultivation. The greatest number of window plants are Fuchsias and zonal pelargoniums, and there are very few greenhouses throughout the country that do not contain a Fuchsia of some kind or other. Perhaps it is because the Fuchsia is such an easy plant to grow that so few good plants are seen in our greenhouses. The old plants which have been resting in sheds or under the greenhouse stages should be brought out and put in a temperature from 45 to 50 degrees, and syringed daily. Very soon young shoots will break forth all up the stems, when the plants should be turned out of their pots and have all the soil shaken off their roots. After this gather all the roots in your hand, letting their ends come out between your thumb and fingers, then take a sharp knife and cut all the ends off. This operation will cause young roots to break out more freely. Next have some clean pots ready, just large enough to hold the roots comfortably without squeezing them together. The soil for potting must be quite fine to run between the roots. To every bushel of soil should be added two quarts of wood ashes, one quart of bone meal, one quart of charcoal dust, and one quart of silver sand. The two last are very important items; the others may be dispensed with if difficult to procure. This compost should be neither wet nor dry, but medium. The plants should then be put into a temperature of about 50 degrees and not watered, but kept moist by syringing daily. Strong shoots will soon be produced, and when two inches long cuttings may be taken off for propagating.

AN EASY WAY OF STRIKING CUTTINGS.

They may be struck in boxes or large pots with their heads below the tops, so that a pane of glass may cover them. As soon as they are struck pot them off singly in 2½ inch pots. Do not water them for a few days, but keep moist by syringing two or three times a day, and give a light shade during bright sunshine. When the roots have well reached the sides of the pots, repot into 5-inch size.

COMPOST.

Instead of the soil being fine now, fresh turfy loam is the best material to use. It is much better to char the turves over a fire; let them get hot enough to destroy the weed seeds, insects, and eggs, also all fungoid germs which may be in them. This will also enrich the turves by making their ingredients more soluble. Pull the turves into pieces about the size of cob nuts with your fingers, which is better than chopping them, and mix the same ingredients as before. If the bonemeal cannot be had, use a small quantity of horse manure which has been fermented a little, but the bonemeal is much the best. In potting press the soil down gently with the fingers, and give one or two raps with the pot upon the bench to settle the particles together, but do not ram it with a stick. Put the plants back into the greenhouse, and give them a light watering with a rose the next day.

AFTER TREATMENT.

Syringe freely, as fuchsias like a moist atmosphere while they are growing. If the house is a span-roof running from north to south, shading will not be necessary; but if it faces south as a lean-to, a slight shading from the midday sun is best for them. Any shoots which are growing stronger than the rest should be pinched in. It is better to do the pinching once a week than to be always pinching, then the plant grows more regularly. When the plants have been potted about ten days give a little soot water, weak at first, every other time they are watered. Before they get potbound shift them into seven or eight-inch pots, according to the size they are wanted to be grown. Give weak liquid manure every other time they are watered. One of the best manures is a small teaspoonful of superphosphate of lime every Saturday, and half an ounce of sulphate of ammonia to the gallon of water every Wednesday. In two or three weeks after they have been put outside every shoot will be thickly studded with buds; and, when in flower, the plants will be fit for any position—exhibition or decoration. All the bloom buds should be picked off when they are growing inside as soon as they are seen. The teaspoonful of superphosphate of lime is sprinkled evenly over the top of the soil in the pots. Another excellent manure for fuchsias, which can be used instead of the soot water or sulphate of ammonia, is blood from slaughterhouses, diluted with water according to the strength of the blood, as there is often other ingredients with it.

THE BEST SORTS TO GROW.

Phenomenal is one of the largest varieties, and has for some time been a great favorite with amateurs on account of its very large blooms. There is also a white variety with blooms not quite so large. Champion of the World and Avalanche are very good double darks. Other good double whites are Molesworth, Mrs. H. Cannell, Kingsburyana, and Miss Lucy Finnis. The single varieties adapt themselves better for making pyramids, but the doubles make good bush plants. Good single dark ones are Charming, Lye's Rival, General Roberts, Try-me-o, and Lord Falmouth. Light-colored singles, Annie, Covent Garden White, Guiding Star, Minnie Banks, Cannell's Gem, and Mrs. Rundle.

When forcing Roses keep a sharp look out for mildew on the plants; should the pest make its appearance, at once apply flowers of sulphur.

When forcing produce of any description do not at once remove the plants from cool quarters to a very high temperature gentle heat is best at first.

RHODODENDRON BEDS.

NEW AND OLD.

Rhododendrons rank very high amongst flowering shrubs, and deserve to be more extensively grown even than they are. All soils will, however, not suit them; in some districts where the plants are not disturbed to any great extent, and where the ground around them is left in its natural state, thousands of young bushes spring up every year as a result of the dropping of the seeds, especially those of R. Ponticum, which is the most common of all.

How very dearly would owners of small gardens near to towns prize a few fine specimens such as grow wild in some of our outlying woods. It has been my privilege to live for many years near to where hundreds of acres of Rhododendrons thrive, and I have thus been able to study their growth.

It is next to impossible to grow a good specimen of any of the different varieties in soil containing calcareous matter. Used soil, such as we have in our vegetable gardens, is not good for Rhododendrons. But a very sandy peat, or fibrous loam, even if the latter is inclined to clay, will suit the plants better. The sandy peat is mostly found in woods and on common ground, and where ordinary garden loam is unsuitable it is best to go to the trouble and expense of obtaining a quantity of peat for the special purpose of growing the plants. Though Rhododendrons luxuriate in a peat bed, I have seen large numbers thriving in the crevices amongst rocks where a limited quantity of soil was available for the roots, but where water was dripping from rock to rock almost the whole year round.

Some of the hybrids have a very compact habit of growth and are highly suitable for cultivation in small gardens. All Rhododendrons should be carefully cultivated and not neglected when once they are planted. But the culture must consist of surface hoeing of the soil and of applications of top-dressings annually, chiefly; on no account must digging be done amongst the plants, as they are surface rooting, and the better they thrive the more will the roots form a mat near to the surface.

Standard Rhododendrons look very beautiful indeed, and an avenue of them with a pathway between has a very imposing appearance. But even in small gardens, a standard specimen or two may be grown. On large lawns the clear stem of the plant should be about 5 feet; on smaller ones, from 3 feet 6 inches to 4 feet.

Good drainage is essential, especially where beds are made on the level ground or in hollows where a clayey soil obtains, but on slopes and raised borders at the edge of lawns artificial drainage is not necessary. How very effective are the branches of these plants where they form an undulating fringe resting on the green lawn at the edge of a shrubbery. The cutting back should be done piecemeal and not all at one time, as in the case of the common laurel. Some of the more delicate sorts are soon injured by injudicious pruning, but Ponticum and Catawbiense hybrids will withstand free pruning.

Where new beds have to be formed, take out the original soil to a depth of two feet or so, and displace it with a sandy peat and some very fibrous loam, make the mixture very firm, and put in healthy plants with plenty of fibrous roots attached to them. After planting mulch the surface, and pay close attention to watering for some months, as valuable specimens are often lost through neglect in this matter. Help them to get well established.

These are a few pretty sorts, namely, Austin Layard, rosy crimson, dark spots; Broughtonii, also rosy crimson; Countess of Normanton, white, dark margin; Duchess of Sutherland, white, rose margin; Alexander Adie, rosy scarlet; Cynthia, crimson flushed with rose; Decorator, clear scarlet, dark spots; Dhuleep Singh, dark crimson; Earl of Haddington, fine rose; Frederick Waterer, bright crimson; George Hardy, fine white; Grand Arab, crimson; Helen Waterer, scarlet, white centre; John Waterer, fine carmine; Kate Waterer, rosy crimson with yellow splash; Lady Eleanor Cathcart, clear rose with crimson spots; Lord Eversley, scarlet crimson; Magnificum, light rose; Mrs. J. Penn, salmon pink; Mrs. John Waterer, rosy crimson; Pictum, clear white, with orange spots; and Pink Pearl, a beautiful flesh colored pink.—G. R. KNURR.

PINK DOGWOOD.

Although perhaps twenty years since the introduction of the pink dogwood, Cornus florida rubra, no nurseryman has all the stock of it he could sell. Every year quantities are propagated, but to get a supply of large plants seems impossible. The demand for it is so great that the small one or two year plants are sold at once, leaving none to grow up larger.

It is not to be wondered that the demand for it is so extensive. When a good-sized bush of it is in bloom it is a glorious sight, and a sight no other bush or small tree approaches in appearance. Dogwoods are pretty trees always, whether in flower or not, and even when not in leaf they are ornamental. When a large bush of the pink dogwood is in flower, strangers, at a little distance away, are at a loss to know what it is that presents the lovely sight.

The dogwood does better planted in spring than in autumn, and better yet set out early. But do not look for a good growth the same season. If the least semblance of foliage appears it is all right, the tree will grow, and the following season will see better results.

It has often been noted that the flora of Japan bears striking resemblance to that of our own, and this is borne out in the case of the dogwoods. The Japanese Cornus Kousa, while distinct enough from our C. florida to be easily recognised, bears a great resemblance to it. It blooms somewhat later in the season than our species.

A few plants of the pink dogwood grown on in pots for a year or two would set lots of flower buds, and, being a hardy, small tree, and so beautiful, would surely command a good sale. And the same is true of the common white one.

Growing Cyclamens in strong heat can only end in spoiling both the flowers and the foliage.

THE CHINESE DOUBLE PRIMULA.

These are not so extensively grown now as was the case ten years ago. I suppose the great improvement effected in the single varieties and the reintroduction of the stellata section are the causes of this. A drawback in dealing with the double sorts is that they are more difficult to grow than the singles, and often die wholesale. Of course the treatment is at fault, as while at one place the plants barely live, at another they flourish grandly. I wonder how many collections of plants are entirely lost every season simply through mismanagement. A few hints on the culture of double Primulas will, I am sure, be appreciated by many lovers of these charming winter flowering greenhouse plants.

The warm greenhouse or conservatory is the best place for them; too much heat is not good, and a very low temperature and a damp atmosphere are also disastrous. Old plants are often infested with small grubs, and rot off just below the surface of the soil. Young plants should be procured annually by the process of rooting the small side growths of each specimen.

Directly the blooms fade remove the plants to a cool frame; cut off all bad leaves and place a mixture of leaf soil, loam, and sand in equal proportions around the old plant in such a manner that the lower part of the young side growth is buried in it. A uniform moisture is necessary for inducing rapid root action; and to securely cover the added compost with a layer of moss. Too much water would quickly result in injury to the plants by causing decay.

Five or six capital young plants may be obtained from one healthy old one, and the pots containing the latter should be placed upon ashes. During very bright weather put on some light material as a shading. At the end of six weeks or two months roots will have formed plentifully in the new soil, and it will be the right time to detach the side growths and repot them separately. A similar compost should be employed, but 1 gallon of old mortar rubbish passed through a ½-inch sieve must be mixed with every bushel of it. A cool frame, genial moisture and temperature are again requisite. Indeed, frame accommodation is the best for the plants until they are placed in the greenhouse in autumn.

At each repotting use the loam in a more lumpy and fibrous condition and always with old mortar incorporated with it, as Primulas delight in its gritty nature. If these instructions are followed large healthy plants will be the result. A small quantity of weak soot water may be given them, but I do not favor high feeding with artificials. The earliest plants may be flowered in 5 inch pots, and the later ones in 6 and 7 inch ones.—GEO. GARNER.

ROMNEYA COULTERI.

THE CALIFORNIAN TREE POPPY.

English plant names are not always appropriate, any more than the cumbrous Latin or Greek ones; but a glance at the illustration of some flowers of the Californian Tree Poppy, as Romneya Coulteri is popularly called, shows how aptly this familiar appellation has been given to it. Of course the photograph only shows a few blooms, but it tells far more graphically than any words of mine how Poppy-like are those lovely flowers, with their graceful, fragile, and fugaceous petals, which seem as if they would be the sport of a rude wind or a prey to the rough wooing of the weather of our islands.

The Romneya is a good herbaceous plant, with glaucus, prettily-cut, and ornamental foliage; but it is in the flowers that its glory lies, and they are the embodiment of floral elegance and beauty. They are white, beautifully crinkled, like so many of the Poppies; while the large central boss of yellow stamens adds to the beauty of the effect. Then thay are fragrant, so that the combination of merit appeals to most of those who love flowers. Its failings are not many, but they are serious enough. For one thing, the flowers are fugaceous, and a high wind will soon cause them to shed their fragile petals. For another, the plant itself is only doubtfully hardy in many places, although I believe that a good deal of this reputation is due to the losses of single plants alone, while if two or more had been planted one might have survived. Even in the Leeds district—not one of the warmest in Britain—I have seen it thoroughly established in the open air, and receiving no protection except that given by its decayed stems, which were left on until the spring to ward off severe frosts. Some grow it upon a wall, but there is no comparison between plants on a wall and the more beautiful ones in bush form. It makes, however, a good greenhouse plant in a pot, and the delicate flowers can be protected from the wind when cultivated.

The Californian Tree Poppy likes a fairly good but dry soil, and a sheltered position ought always to be selected, with a south exposure, or one facing south-west. It can only be satisfactorily propagated from seeds, as cuttings do not strike readily, and seedlings grown on in single pots establish much better than others. In ordering plants from a nurseryman, it should always be a stipulation that the Romneya should be supplied established in pots. Seeds should be sown in spring in a gentle hotbed or in a greenhouse, the seedlings being transplanted singly when fit to handle into small pots, shifting them occasionally without disturbing the ball of soil. They must be kept from frost when young, and planted in their permanent positions in late spring. So beautiful a flower should become a favorite, and any failings it may possess will be found far out-balanced by its many attractions.—"The Gardener."

CYTISUS RACEMOSUS.

Cytisuses, or Brooms, afford us a considerable number of exquisite plants of shrubby character. Many are hardy, but a great number must be grown under glass to protect them from inclement weather or to permit of their flowering in our climate. C. racemosus is one of the most pleasing of the greenhouse species. It is a very ornamental shrub, growing three feet or more in height, having trifoliate leaves and pretty spikes of yellow flowers in great numbers these blooming generally from September onwards. There is a variety named Everestianus, which has deeper colored, sweet scented flowers. This is probably the same as the variety called superbus.

The greenhouse Cytisuses are not at all difficult to manage. They bloom more freely when planted in loam than if in peat, and are all the better for being kept out of doors for a month or two in autumn, although the soil must be carefully watered in dry weather. After flowering they may be cut back into shape, and repotted when they make some fresh growth. In winter, if wanted early, they may be brought on in a temperature of about 50 degrees. Cuttings strike well in September, if several are put into a 6 inch pot and kept rather close until they begin to make growth.—S. R. Nott.

WINTERING SALVIA PATENS.

This beautiful blue flowering Salvia may be readily grown and propagated by cuttings that spring from the base of the old plants, which should be taken off and inserted in pots of fairly rich soil. They will quickly emit roots if placed on a mild hotbed or in the propagating pit. When well-rooted the plants may be potted up singly at once, and then potted off into 60-sized pots and grown quietly on until the time arrives for planting in the beds or borders. The old plants should be lifted and either stored away in a dry cellar with the soil adhering to the roots or be placed in boxes, which may easily be removed as required from one place to another. Avoid any excess of moisture about them during their season of rest, or spindling shoots will push up prematurely, thus weakening the plant considerably, as they would have to be taken off. If desired, some cuttings may be taken from the old plants in spring when the growths are about two or three inches in length, and these will make fairly strong plants for bedding out in the same year. A very effective bed in these gardens during the summer contained a mass of Salvia patens, and these grew to a height of 2½ feet; as a groundwork we planted Mesembryanthemum cordifolium variegatum, and this made an effective carpet. In the centre of the bed (which is circular) stands a large flat vase; this was planted with Pelargonium John Gibbons, round a large central plant of Agave americana variegata. This was a very pleasing arrangement, and there are in all gardens equally suitable positions where a grand display may be made with this useful yet somewhat neglected blue-flowering plant.—H. T. Martin.

DIGITALIS ORIENTALIS.

THE EASTERN FOXGLOVE.

To most of us the name of Foxglove is a reminder of the sunny days of youth, when we roamed through the haunts of the flowers of our own land, and plucked the blooms from the noble digitalis plants to place upon our fingers, thinking, it might be, of the foxes, or more correctly of the folk, or fairies, whence the name of Fox or Folk's Glove was derived. We have no more effective wild flower than D. purpurea, and to it we owe the many noble Foxgloves of varied hues which brighten so many gardens in summer.

To those who know these garden Foxgloves which have originated from D. purpurea, the Eastern Foxglove, D. Orientalis, must seem ineffective and unattractive. Yet it has its features of interest. It has not the noble compact spike of tubular flowers of our own Foxglove, nor has it the bright-hued and well-formed blooms the former gives. The spike is of fair length, but the flowers are smaller and more sparsely arranged along its length, and with leaves between.

Then the form of the flowers is peculiar compared with those of our wilding, for the lower lip is, so to speak, drawn out and projects beyond the rest of the bloom. The color is whitish, but the flowers have not much beauty in themselves. As a garden flower D. Orientalis must rest its claims upon the general effect of the whole plant, which is one to be used sparingly in a small group to give a distinct look to a border or a wild garden. It is well suited for these purposes, seeing that it is a perennial. It should not, however, be in a cold or exposed position, since it is a little tender, like some other plants from the Levant, whence it was introduced in 1820. It should be raised from seeds, which ought to be sown in spring under glass, the young plants being wintered in a frame the first season after being raised. Seeds are, however, very scarce, and it is possible that those of D. ambigua or D. lanata, which have occasionally been named D. Orientalis, may be substituted. When planted out this Foxglove should have a rather dry place. I grows from 1½ to 3 feet high.

Solomon's Seal is a plant that frequently succeeds admirably beneath the shade of trees.

Clear liquid manure, given once or twice a week, is of great assistance to Camellias that are swelling their buds.

There is always the greatest danger of overwatering Orchids at the time when they are just commencing to grow after resting.

It is not essential in all cases, but it is a wise plan, to so arrange garden crops that they follow each other in rotation.

MUSICAL EDUCATION.

There are many country homes, and also homes in the suburbs, where gardeners and their families greet an evening's recreation with music as a great boon. So it should be. The difficulty very often lies in the fact that while the piano or organ is there the musician is wanted. To supply this pleasure we are introdncing from America a Chart of Musical Chords, arranged by Mr. Charles E. Pratt. By the use of these Chords, which any ordinary intelligent person can learn quickly without any previous knowledge of music, an accompaniment can be played to any song yet composed. In addition to the Chart the publishers supply a book of popular songs, containing 48 pages, all for the very modest price of 2s. 6d. and postage. On receipt of 2s. 6d. and postage 2d. we will send the chart and music to any address in the Commonwealth An advertisement appears on page 14.

The Orchard.

OPERATIONS FOR JUNE.

The orchardist has been busy picking and marketing his fruit, and cleaning up the garden, and now must prepare for planting and cultivating. He must plant with a specific object in view, and Mr. C. Bouge Luffmann has some very instructive remarks to make upon the business. He says :—

"Everyone dealing with trees for profit should know the functions, instinctive habits, and value of all their members. A tree above ground is composed of five more or less permanent parts; that is, excepting its leaves, flowers, and fruit. It has—

1. A trunk; from which proceed
2. Main branches; from the mains spring
3. Secondary branches; from the secondaries grow
4. Laterals; and from these
5. Spurs or shoots.

Fruit is borne on the latter types only, though they do not spring solely from the laterals, but may be produced direct from the secondaries, and, to an unimportant extent, on the main branches of some trees.

No matter what the variety, age, or type of a standard tree, these five kinds of wood compose its head, and the orchardist should know the suitable position and proportionate size of each part. All fruit is borne on light wood only, therefore this must be generally distributed throughout the entire head (saving the main branches). The spur, or shoot, is dependent on a certain amount of light and air to develop its buds, their subsequent blossoming and perfecting of fruit.

The following is a select list of leading fruits for local and export markets :—

Good Pears.

Beure Clairgeau, May and June.
Doyenne de Comice, June and July.
Vicar of Winkfield, June and July.
Eyewood, June to August.
Josephine de Malines, July and August.
Winter Nells, July and August.
Easter Beurre, August and September.
L'Inconnue, August to October.

Good Apples (June to August).

Jonathan.
Rome Beauty.
London Pippin
Prince Bismarck.
Munro's Favorite.
Esopus Spitzenberg.
Rymer.
Reinette de Canada.
Stone Pippin.
Scarlet Nonpareil.
Cleopatra.
Shepherd's Perfection

Good Apricots (in order of ripening).

Oullin's Early.
Kaisha.
Alsace.
Hemskirke.
Mansfield Seedling.
Moorpark.

Almonds.

Paper Shell.
Brandis Jordan.
I.X.L.
Nonpareil.

Good Peaches (in order of ripening).

Alexander's Early.
Briggs' Red May.
Downing.
Early Rivers.
Hales' Early.
Royal George.
Duke of Edinburgh.
Merchant Campbell.
Lady Palmerston.
Salway (or Mixon Free
Susquehanna
Whatmough's March.

VALUE OF SEAWEED FOR FRUIT-TREES.

Seaweed for various garden crops is seldom used so freely as it might be, especially by those whose gardens are situated near to the coast. Many no doubt in the midlands would be only too pleased to lay in a store for asparagus and seakale plantations, but the distance entails too much outlay for seaweed to be used generally for such purposes, while others who can obtain large quantities for the mere cost of carting appear to ignore its value. Those who have not tried seaweed in their orchards or fruit gardens would be surprised at the beneficial effect it has on the trees, especially apples and pears, when, of course, it is used with care and moderation. This is particularly the case during dry seasons. My first impression—and it was not a slight one—was gained at Bembridge, Isle of Wight, on land reclaimed from the sea. The soil is undoubtedly to a great extent composed of thoroughly decayed seaweed and sand, and the way all vegetation appears to thrive in it is marvellous; and it occurred to me that for light soils and for use during a very dry season seaweed would undoubtedly prove more valuable as a mulch than any other material generally used for the purpose. Apart from any manurial properties it contains, it is, like salt, moisture-holding as well as feeding, the value and importance of which should not be ignored by those whose fruit-trees are growing in too porous soils and where the rainfall is light. I certainly never saw more healthy trees, or better samples of apples, though, of course, the climate and situation are also very favorable for their production. I should not advise burying fresh seaweed near to the roots of established trees or incorporating it with the soil in forming a new orchard or fruit garden, but frequent mulchings of the surface ground are, I am sure, a safe means of stimulating growth and sustaining the trees under the trying influence of a long drought. By this means it would gradually find its way into the lower stratum, and undoubtedly improve its staple.

Seaweed varies considerably, some being far too coarse and heavy for the different purposes mentioned above, unless it has first had sufficient time for partial decomposition. Preference is given to that of a finer and lighter character, which when collected generally contains a fair amount of sand, making it more suitable in every way for use in the garden.—P.

COLD STORAGE,

With special reference to the Peach and Pear.

G. H. Powell and S. H. Fulton, U.S. Dept. Agr., Bureau of Plant Industry Bul. 40, pp. 28, pls. 7.

Besides a general discussion of the subject of cold storage, particularly as applied to fruit, an account is given of some experiments to determine the influence of degree of maturity, delayed storage, storing at different temperatures, types of packages, wrapping, &c., on the keeping quality of pears and peaches; also the influence of cold storage on the flavor and aroma of fruit, and the behaviour of fruit when removed from storage. Considering the whole country, it is estimated that about 300,000 bushels of pears are stored annually, mostly in the larger Eastern cities.

In the experimental work reported Bartlett and Keiffer pears were the varieties principally used. The Bartlett is a tender variety of good quality, ripening in hot weather. It is withdrawn from storage before cool weather. The Keiffer is a coarse, long keeping, hard pear, ripening in the fall and withdrwn from storage in cool weather. Work with Bartlett pears was carried out in western New York. Full grown but still green fruit was picked early in September and packed in tight and ventilated barrels, in 40-lb. closed boxes, and in slat bushel crates. Part of the fruit in each lot was wrapped in unprinted newspaper and part left unwrapped. Some of the fruit was put in storage within 10 hours after packing, and an equal amount held 4 days before placing in storage. In the storage room part of the fruit was kept at a temperature of 32 deg. F. and part at 36 deg. F.

It was found that Bartlett pears packed in a closed 40-lb. box or a slatted crate could be kept in cold storage [illegible] weeks in prime condition when stored within 48 hours after picking and placed in a temperature of 32 deg. F. When the fruit was not placed in storage until 4 days after picking there was a loss of 20 to 30 per cent. from softening and decay. Bartletts stored at a temperature of 32 deg. F. were in prime commercial condition 4 to 5 weeks longer than when stored at 36 deg. F. When packed in barrels and stored in a temperature of 32 deg. F. soon after picking, the fruit at the centre became yellow within 3 weeks, although the outside layers were firm and green. After 5 weeks the fruit at the centre of the barrels was soft and of no commercial value, while the outside layers were still in good condition. There was practically no difference in the keeping capacity of the fruit in the tight and the ventilated barrels. The fruit in both the closed 40-lb. box and slatted crate kept uniformly firm and green through the package. The chief advantage derived from wrapping Bartlett pears seemed to lie in the mechanical protection to the fruit rather than in its efficiency in prolonging its season. Wrapping is advised for superior fruit designed for first-class trade.

The Keiffer pears used were selected from orchards in Maryland and Delaware. They were picked at 3 degrees of maturity, beginning when the fruit was two-thirds grown and continuing until it was fully grown and showing a yellowish tinge around the calyx. Part of it was placed in cold storage within 48 hours after picking and part left 10 days in common storage before being placed in cold storage. Duplicate lots were stored at 32 and 36 deg. F. respectively. Some of the fruit at both temperatures was wrapped in parchment paper and unprinted newspaper and some left unwrapped. The packages used were barrels, 40-lb. closed boxes, and five-eighth bushel baskets.

The results of the experiment show that Keiffer pears may be picked during a period of 3 weeks beginning when they are two-thirds grown and successfully stored until the holidays, or much longer if necessary providing the fruit is handled with the greatest care and placed in cold storage at 32 deg. F. immediately after picking. Pears stored 10 days after picking soon began to discolor and soften at the core, though the outside of the pears appeared perfectly normal. Within 40 to 50 days the flesh was nearly all discolored. The fruit kept 3 months longer at a temperature of 32 deg. than at 36 deg. F. It kept much better in small packages than in barrels. The chief advantage of ventilated packages seemed to be in the greater rapidity with which the fruit cools. Pears stored in open packages for a long time wilt considerably. Closed packages are therefore recommended.

Wrapped fruit kept longer than unwrapped, and wrapping proved especially valuable as the season advanced. Nearly 50 per cent. of unwrapped Keiffer pears had decayed by January 1, while those wrapped in unprinted newspaper and parchment wrappers were still in good condition. Little practical difference was noted in the relative efficiency of tissue, parchment, unprinted newspaper, and wax paper for wrapping fruits. In storing fruits for a long time a double wrapper was more efficient than a single wrapper, a satisfactory combination being unprinted newspaper next to the fruit with the more impervious paraffin wrapper outside. No evidence was deduced from these experiments to show that cold storage injured the aroma or flavor of pears. On the contrary, the quality of the fruit was maintained longer at a temperature approaching the freezing point than at one any higher.

The results secured in these experiments indicate that pears should be picked before they mature and stored as quickly after picking as possible, and that the fruit should be stored at a temperature of about 32 deg. F. unless it is desired to ripen it up slowly at a higher temperature. Small packages which cool very quickly are best. Wrapping prolongs the life of the fruit, protects it from bruising, lessens wilting and decay, and keeps it bright in color. The rapidity with which cold-storage fruit breaks down when placed on the market depends upon the degree of ripeness of the fruit and the condition of the weather.

The peaches used in the experiment were grown in Georgia and Connecticut. They were stored at temperatures of 32, 36, and 40 deg. F., respectively. Various kinds of packages were used and the fruit was picked at 2 different degrees of ripeness. Equal quantities were wrapped and left unwrapped. The results show that when highly colored firm fruit was placed in the storage house at 32 deg. it could be kept in prime commercial condition for 2 or 3 weeks. After that time the quality deteriorated, though the peaches continued firm and bright in appearance for a month. Mellow fruit when stored deteriorated much more rapidly, and unripe fruit shrivelled. At the higher temperatures of 36 and 40 deg. the fruit ripened much more rapidly and reached its profitable commercial limit within 1 to 2 weeks. At the lower temperature the fruit kept equally well in all packages for about 2 weeks, after which that in open baskets and Georgia carriers began to show wilting. In 20-lb. boxes the fruit remained firm throughout the storage season. Wrapping the fruit proved a great protection against bruising in transit. Fruit stored at 32 deg. F. for 2 to 3 weeks stood up 2 or 3 days after removal, depending on the weather. It is pointed out in this connection that in shipping peaches those at the top of the car are likely to ripen much more rapidly than those in the bottom layers, and hence should be marketed separately. The chief value of cold storage in the peach industry is likely to be found in the temporary storage of the fruit during an overstocked market.

MANURING GARDEN GROUND.

Common bracken is poor manure. Tree leaves when well decayed make very good manure, and seaweed, if half-decayed, is fair manure. But in using these things it is wisest to mix them in a heap, turning them two or three times at intervals of a month, and at each turning adding a good smother of soot. At the final turning, which should be a couple of weeks before using, add to each cartload 12 lb. of bone-flour (phosphate) and the same of kainit (potash). If that be well mixed with the heap when finally turned it rapidly incorporates with it, and then the whole may be dressed on the ground at the rate of a cartload to each 4 rods of ground. But where artificial manure alone is used, especially in flower borders, the proportion of 6 lb. of the two manures named, forked in and at once, is not too much. But with that give 3 lb. of nitrate of soda per rod in the spring—say, end of May or in June. Plants cannot well take up more than a certain proportion of manure, the rest being so far waste. Give the ground a good dressing of stable manure once in three years if you can.

Vegetable Garden.

OPERATIONS FOR JUNE.

By W. S. Campbell.

Probably the season will continue to be satisfactory during June, and the sowing and planting of all seasonable kinds should on no account be neglected. In the cold districts, except the very coldest, some kinds of cabbage are likely to succeed very well, and sometimes frost improves them. The Savoy and Brussels sprouts, and also the seakale, although not exactly a cabbage, should be grown, and instead of lettuce, try the endive, an excellent substitute which is likely to succeed where the lettuce would fail.

When laying out a new vegetable garden arrange so as to keep the permanent vegetables, the globe artichoke, the asparagus, and the rhubarb by themselves. With these, or rather near them, some strawberries could be planted, unless it be preferred to plant these useful fruits as edgings to the footpaths, but when used in this way they are sometimes more likely to suffer from a dry season than if planted in a bed to themselves.

With the exception of strawberries, which should be planted at once, if not already set out, the permanent vegetables need not be planted until the winter is nearly over, but the ground should be made ready for them. Use abundance of farmyard manure unless the soil is naturally rich, when it may not need the application of any at all. Make the beds so that water is not likely to remain in them, but do not elevate the surface to any great extent if at all above the surrounding surface. Trenching would, of course, make a bed very much higher than adjoining untrenched land; but if you trench, trench the whole garden, footpaths and all, and then no one part will be more elevated than another, and all will be equally drained.

Artichoke, Globe.—May be planted now if desired, but there need be no hurry about it. Either suckers or rooted plants may be used. Plant 3 ft. or considerably more apart, for if the soil is rich the plants will probably grow to a considerable size.

Artichoke, Jerusalem.—The tubers of this plant, which is quite different to the above, have been ready for use for some time. They are rather difficult to keep good when dug up, and the best way to manage with them is to dig as required. When digging them up take out every little bit, for anything left in the ground will most likely grow. Towards the spring a planting should be made for next season's use.

Broad Beans should be growing well and also bearing in some districts. Another sowing or two may be made during the month.

Cabbage.—Sow a little seed to meet probable requirements, and plant out any strong young cabbages that are ready to shift.

Endive.—Sow a little seed to keep up a supply, and plant out a few plants occasionally.

Carrot.—Sow a row or two occasionally, and be careful to thin out well when the plants are large enough to handle. Try Early Shorthorn, a useful kind for the season.

Leek.—Sow in a seed-bed in order to raise plants for setting out later on. If good-sized plants are already growing transplant them to ground that has been heavily manured and well prepared. Try the varieties London Flag and Imperial Musselberg if they are obtainable.

Lettuce.—Sow a little seed occasionally, and plant out any strong young lettuces that may have been raised.

Onion.—Sow a little seed, and look well after and keep weeded any young onions that are above ground.

Parsnip.—This vegetable may be sown as largely as may be required. The soil should be dug deep, as the parsnip is a very deep rooter. Sow in drills.

Peas.—Sow largely in rows from 2 to 3 ft. or more apart, according to variety, for some kinds grow to a height of 1 foot, but others to a height of 5 or 6 ft., and the tall growing kinds need a good deal of space between the rows. The general average height is about 3 to 4 ft.

Radish.—Sow occasionally during the month a little seed of different varieties.

Herbs.—In warm parts of the State plant or take up old plants if they have become evergreen, then divide and plant.

Onions.—Seedlings 3 or 4 in. high from the early sowings may now be planted out. No better weather could be selected than that prevailing this season. The soil should be fairly rich, sandy, and well drained. Land that has been occupied with some leguminous plant or crop is best, and well tilled to bring into its finest condition. A sheltered situation is advantageous. Cut off the top leaves where they join the stems. They will give best results with a good manuring of well-decayed stable manure. If it be not well rotted the trouble of getting rid of the weeds from it increases the labor. Failing a supply of the right sort it will be better to use bonedust or a mixture of superphosphate three parts and blood manure one part.

Beans, Vetches, and Peas.—These do best on soils containing lime, and where lime is not available basic slag is best suited to their requirements; in all cases, however, the land containing a natural supply of lime is most suited to a maximum growth. A heavy dressing of superphosphate or basic slag with about 4 cwt. of kainit will give the best results on poor land for peas, beans, or vetches. For sowing peas an ordinary maize drill will answer best. Plant 2 to 3 ft. apart. Pea straw contains in its ashes from 35 to 40 per cent. of lime and 12 to 15 per cent. of potash. This indicates the class of soil it requires.

Sweet Potatoes—Arrowroot.—So far the sweet potatoes have been somewhat late in maturing, and the crop has not been so prolific. They should be dug and stored in sand for future use. The arrowroot tubers after boiling can be used extensively for pigs. They form an excellent heat and energy-producing food for pigs in winter.

Sorghum.—The recent rains, where the sorghum crops are late, will interfere with the operation of converting them into hay. Sorghums of all kinds this autumn have made very satisfactory growth. Where silos are available they have been converted into chaffed ensilage. That which is not needed for stall-feeding the dairy cattle may be converted into stack ensilage, with every prospect of good results. In the former case, the crop may be left standing for the next two or three weeks to be cut daily as required for the cows.

Rape.—This crop is yearly becoming more popular, and its feeding value is becoming recognised. It is evidently- replacing several root crops. It is very rapid in its growth, and in favorable seasons is ready for feeding in from twelve to fifteen weeks. It is being especially appreciated for feeding sheep and pigs. The most forward variety grown is the Dwarf Essex. When sown in drills, and well cultivated, few crops will act better as a land clearer. It gets rid of weeds. The growth now is very luxuriant and fleshy, and may be eaten down by sheep or pigs when it reaches 6 inches in height. The crops are best where bonedust two parts, with one part of blood manure, has been used as a manure on light sandy soil. The advantage of eating the rape crop down this month is that a vigorous second crop follows. This naturally depends to some extent on the class of soil and the abundance of moisture. We may now safely predict favorable conditions. Sheep, when eating the first crop, are liable to eat it off too close. This can be avoided by turning them off when they remove the first lot of leaves. They generally eat those first, and return to more closely remove the lower tendrils, leaves, and stems. Horses and cattle will eat rape, but in doing so they injure the plant and retard a good second growth. Further, fresh rape will taint the milk in dairy cattle, which can be avoided by feeding the rape immediately after milking. In every case animals, when very hungry, especially cattle and sheep, eat it greedily, and are liable to sudden attacks of hoven or bloating. It is advisable to break them into feeding it gradually, and after a week's attention allow them free use of the paddock. It is good practice to feed all animals half on grass and the balance on rape. Hoven is more prevalent during wet weather or when heavy dews fall. Whilst on rape, cattle and sheep do best when given free access to rock salt. An average rape crop should feed ten to fifteen sheep to the acre, and fatten them for market in sixty days. A series of tests at Wisconsin and other experimental stations have shown that in pig-feeding an acre of rape is equal to 2.657 lb. of grain. The pigs proved to be more thrifty and in healthier condition when fed with rape than when fed with grain alone. Considerable saving in labor is effected in grazing pigs on rape. Moreover, the ground is enriched from the excreta of both sheep and pigs when fed in this form. The dry matter of rape, from analysis, is proved to contain as much protein, or flesh-forming material, as clover hay. The past season has brought home to many large poultry-raisers the need to substitute green feed of a heterogeneous character for the more expensive nitrogenous food such as bran and pollard. Amongst the most useful of the green feeds for poultry is rape. Repeated trials have fully demonstrated the value of this fodder for poultry.

Mr. G. L. Sutton, experimentalist at the Hawkesbury Agricultural College, furnishes the following report concerning experiments with rape: The following results in connection with an experiment conducted at the H.A. College will prominently illustrate the great value of this splendid forage crop for alleviating the effects of a drought when the drought has broken. The crop was planted April 30, 1903. A sowing had been made on the same ground five weeks previously, but germinated so badly, owing to the dry weather then prevailing, that the land was disk-harrowed and resown on the date stated. Shortly after the second sowing the drought broke, the seed germinated well, and within a month there was good grazing for sheep. On May 15, 1903, less than seven weeks from planting, the various blocks were cut for pig feed, and the following computed yields per acre obtained:

Rape for Greenstuff: First cutting, six weeks three days from planting—Broadcast, 11 tons 4 cwt. 3 qr. 16 lb.; Drills, 18 in apart, 9 tons 17 cwt. 3 qr. 17 lb.; drills, 24 in. apart, 7 tons 4 cwt.; drills, 30 in. apart, 6 tons 4 cwt. 1 qr. 5 lb.; drills, 36 in. apart, 5 tons 0 cwt. 1 qr. 22 lb.

It should not be inferred from these results that broadcasting is the best method for growing this crop in ordinary seasons—they indicate how rapidly this plant grows. Another point of interest to our farmers in the semi-arid districts is, that during the late drought it was observed that the seed of this plant would germinate under conditions too dry for the germination of many other seeds, wheat included.

£400,000 A TON FOR POTATOES.

The London "Daily Mail" states that at a sale of seed potatoes at Spilsby, in Lincolnshire, all existing records for extraordinary prices were eclipsed. Six tubers of the Eldorado variety were disposed of by auction, the lot weighing only 5 oz. They realised £56/3/6, and as this works out at £402,658/13/4 per ton, it constitutes a world's record. One potato sold for £11, and another for £10/10/; £9/9/ was paid for a tuber that weighed only ½ oz. A stone potato, of a new variety, which has been named the Sir John Franklin, and which has only been on the market a fortnight, sold at the rate of £3,000 per ton.

POTATOES—CUT AND UNCUT SETS.

By W. J. Malden.

The experiments which have been carried out for nearly a century on cut versus uncut sets have generally shown that there is a stronger crop from uncut sets; and the popular mind has accepted this view, which within certain limits is correct. A whole potato is encased in a skin which retains moisture; moreover, many insects, such as wireworms, eelworms, and other scavenging insects do not so readily attack an unwounded set as one which has been cut, or is in any way decaying. A cut set is at once acted upon by surrounding conditions, and decay immediately sets up about the cut portion. Where, therefore, it is planted under conditions where it has to make a struggle for existence, it is not so favorably placed as is one which has no wound. When a tuber is cut so as to provide a large number of sets, the sets are small; therefore, so far as possible, the struggle to establish a plant must be facilitated by all reasonable means. The experience of the last few years shows that this may be done on a large scale at a moderate cost. When in a previous article we urged that it was not a matter of overwhelming difficulty to cut each eye from a potato, and pot it separately so as to give it favorable opportunities to produce a plant, there were those who expressed the contrary view, and maintained that it was impossible for it to be done except on a limited scale. To confirm our expressed views we last spring had 50,000 eyes cut from 14 cwt. of tubers, and planted in as many pots. The plants grew with a very small percentage of misses, and at the present time we have nearly eight acres growing vigorously in the field. Few who have seen the crops would previously have believed that the fine plants now growing could have been raised from other than a whole set of ordinary seed size.

BORECOLE OR KALE.

There are few more hardy and generally serviceable vegetables than borecole or kale. Room for one or several forms ought to be found in every well-managed garden, and if not actually considered a high-class vegetable, kale cannot well be dispensed with. In very severe winters brocolli, savoys, and not unfrequently Brussels sprouts are badly injured by frosts, but it is not often the borecoles are destroyed, some of the varieties being nearly as hardy as it is possible for a green succulent vegetable to be. Their culture and requirements are of the simplest character. If raised too early the plants become starved and leggy in the seedbeds, and such cannot reasonably be expected to do so well as the sturdier later-raised batches. Naturally, the earlier the plants are established where they are to grow to their full size, the stronger and more productive they become. A few only are able to give a piece of ground wholly up to this crop, and the plants must, therefore, be either planted between rows of early potatoes, or else be put out in close succession to these and any other early vegetables. They pay well for having moderately rich ground and good room, the produce of plants growing on poor soil being light and also poor in quality.

Scotch or curled kale is, perhaps, the most popular variety in cultivation, more plants of this being grown probably than of all the rest put together. There may be others more hardy and productive, but in point of quality all are inferior to it. There are very finely curled forms of both the tall and dwarf Scotch kale, and as far as productiveness, hardiness, and quality are concerned, there is not much to choose between them, all producing good greens after the heart has been cut.

Read's improved hearting is a decided advance upon the ordinary forms, this producing a heart almost equal to a savoy cabbage, and milder in flavor and more tender when cooked. Unfortuntely, the hearts when fully grown are not so hardy as desirable, and these ought, in consequence, to be protected in some way whenever a severe frost is anticipated. It is not advisable to lift and store this kale, as a serviceable crop of side shoots is produced in the spring.

Asparagus kale has never in my experience been much injured by cold winds or frost, and is most valuable for affording a supply of succulent greens after all the rest have run to seed. When broccoli, cabbage, and other kales have been much cut up by frosts, a good breadth of the sturdy growing asparagus kale is invaluable.—I.

THE FIG-WORTS.

It is to be regretted that a shorter name than Scrophulariacae has not been found for this order. It is so named because one species has swellings on the root like the neck markings in scrofula; and this word again is derived from the Latin for pig; and the pig is so called from its habit of scratching, the words for pig and writing having a common origin—scratching the ground and scratching the paper. Even the equivalent "fig-wort" is objectionable, for the fig belongs to a very different order. Jussieu's name "Pedicularei," is no improvement.

In this order the corolla is single, and encloses the ovary; the stamens are four, of two different lengths (or sometimes two) inserted on the corolla; leaves alternate, opposite or whorled, and without stipules. The corolla is often shaped like a mask, with a prominent mouth, which can be forced open by bees, which then enter the flower and pollinate it. In the many-colored garden flower, the Salpiglossis, the mask is absent, and the flower is closely allied to the Solanums. The flower garden is largely indebted to this order; we may name the Snapdragon, Maurandia, Lophospermum, Phygalius, Pentstemon with its rudimentary fifth stamen, Calceolaria, Mimulus, Browallia, Schizomthus, Digitalis, Veronica, and the tree Paulownia. Among the weeds we have the dwarf semiparasitic Bartsia, the Blanket weed Linaria Castata, and the tall, yellow-flowered Celsia cretica, the two short stamens of which are curiously bearded.

In many plants there are contrivances to keep out ants and other small insects that are useless for pollination purposes, and that would only rob the plant of its honey. In the Phygelius the ovary is twisted so as to shut in the honey; in the Pentstemon the fifth crosses over and bars out intruders.

It is not uncommon to find the central top flower of Pentstemon to be regular; and a form of Foxglove is successfully raised from seed that has the uppermost flower cup-shaped. By counting the number of lobes of the corolla and the stamens as many as five flowers are sometimes seen to take part in this "monstrosity."

In Mimulus (Diplacus) aurantiacum the stigma is formed by a pair of flaps; if the inner surface be touched the flaps close tightly. Even cut flowers after several days are quite sensitive.

It was a speculation of Goethe's that the parts of the flower are modified leaves. The writer once had a Lophospermum in which the sepals, petals, anthers, stigma, and even the ovules, turned to leaves on footstalks. So complete a reversion is perhaps unprecedented.

A Musical Education for Half=a=crown.

The above heading will, of course, appear to most people as the height of absurdity; yet the absurdity is more apparent than real. It goes without saying that a finished musical education in the regular course cannot be had for half-a-crown, or even with several hundred additional half-crowns; but can it be truthfully said that the person with a sufficient knowledge of music to play accompaniments on the piano or organ, to all the popular songs of the day, has no musical education? Assuredly not. A musical education, sufficient to enable one to play accompaniments to the home frequently, gets and gives more pleasure from the modest accomplishment than does many on whose education large sums have been expended.

To the more modest musical education the above heading applies. Such an education "The Australian Gardener" is now offering its music-loving readers for half-a-crown, believing that it i the greatest benefit we can give our subscribers.

This ready-made musical education consists of Pratt's Chart of Chords for the piano and organ, which is the nearest approach to the ready-made knowledge of music yet attained by science.

It is a short cut to harmony, and is to music what the multiplication table is to arithmetic, a quick method of learning to play the piano or organ without a teacher.

With this chart any one can, with but a small amount of practice, become an expert pianist. It is a complete self instructor, enabling any one to play the piano or organ at sight, and to play, without difficulty, brilliant accompaniments to any song ever written. It is valuable to the advanced musician as well as the beginner, embracing nearly every major and minor chord used in music; and is endorsed by teachers and musicians everywhere.

This chart is the practical result of years of study by Charles E. Pratt, the noted American composer and musician, whose compositions have world-wide popularity, and a larger sale than those of any other American or European composer.

Believing that the educational value of this Chart cannot be over-estimated, "The Australian Gardener" has arranged with the publishers to supply Pratt's Chart of Chords (published at 5s.) to its readers at the reduced price of 2s. 6d. each, with 2d. added for postage, and in addition to the Chart of Chords the publishers have kindly agreed to send without extra charge a copy of the Coronation Musical Folio, containing 48 pages of sheet music, and instrumental by popular composers.

Every home that has a piano or organ, especially where there are children, should have Pratt's Chart of Chords.

This offer is made for a short time only, and "The Australian Gardener" readers should avail themselves of it without delay.

Address—"THE AUSTRALIAN GARDENER," Adelaide.

The Australian Gardener

A Monthly Journal of Floriculture and Horticulture, for Professional, Practical, and Amateur Gardeners.

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The Flower Garden

OPERATIONS FOR JULY.

Plant couch grass for lawns, and afterwards sprinkle seed of the same thinly over the surface. Continue planting hardy annuals of all kinds. Some of the stronger growing sorts may be sown where they are to flower, as they succeed better this way than when transplanted; this is the case with Sweet Peas, Poppies, Sunflowers, and Nasturtiums. Put in cuttings of Lobelia, Petunia, Verbena, and all kinds of Pelargoniums. Hardy bulbs may still be planted, such as the late kinds of Trumpet Narcissus, Gladioli, Ixias, and Freezias. Continue to plant both deciduous and evergreen shrubs and trees, watering them thoroughly as soon as planted. Pruning generally may now be done, and all edgings and hedges should be clipped before digging is commenced. Plant at once for edgings, cuttings of Rosemary, Thyme, Lavender, and Fairy Rose. These should be pressed firmly with the foot on both sides of the Roses immediately after planting, and then well watered. Manure and commence digging all beds and borders.

In the Hills, plant spring flowering bulbs of all kinds. Propagate hardy border plants to provide stock for spring planting. Transplant hardy annuals from the seed beds. Sow in the open borders Forget-me-not, Nemphila, Cornflower, Mignonette, Iberis, Larkspur, Poppy, and Sweet Pea. Manure and break up ground intended for this season's planting, as it is quite time all trees and shrubs were in place. Manure and dig amongst Chrysanthemums, and divide the roots of good kinds at once.

PREPARATIONS FOR SPRING.

The garden beautiful, and the spring sunshine on the spring flowers—Ah! that is just it, this looking forward is the joy and delight of the novice in gardening. Past failures are forgotten, relegated to the days that are no more; it is the golden future that lies before us with all its possibilities.

"Draw us more pictures of spring beauty," the novice cries. "We want to go forward in our gardens. Tell us what to plant, and we will gladly plant. You, who have treasured memories of former springs, when we either had not the opportunity or the interest to observe them for ourselves, tell us by what means we can make our gardens beautiful. Not years hence, when we shall have learned by experience, but tell us of things that shall bloom during the spring that is coming, while there is yet time for us to secure them."

Yes, the time has come to prepare for the spring now. It is the time of all others for this preparation. "It is only a small garden that you have at your disposal," you exclaim. Never mind, there is plenty of room for spring to enter, even if there be but a few square yards.

Suppose that our garden contains a group of tall trees, what a beautiful picture for the spring days we can make it now if now we plant all the ground between them with Anemone Appennina. The pale-blue blossoms are amongst the most treasureable flowers that the spring gives us. The well-known white Wood Anemone is very beautiful, but the blue has the charm of being less generally known. Indeed, there are thousands of people who do not know it, garden lovers though they may be.

Primroses may well be associated with the blue Windflowers, for, of all combinaitions of colors, few there be that are more pleasing than the soft pale tones of blue and the delicate primrose tone of yellow. But, for all that, care must be taken at the time of planting, and each must be planted in what I would call drifts, and nowhere, though the two colors meet and mingle, must there be a patchy medley of color.

Hepatica is another spring flower that all who have learned to know and love the blossoms of the early year could ill spare from their borders. It may be obtained single or double varieties, in pink, blue, or white—except that the double white is now impossible to obtain. It is one of the beautiful things that there is reason to fear is lost to us for ever. Hepaticas may not flower the first season, as they dislike being disturbed, but they are worthy of patience and watching, and when they do flower the reward is great. The foliage, too, is of considerable decorative value. This plant is more suitable for beds and borders of perennials than for the wilder portions of the garden.

There are many among us who have fallen under the fascination of the Irises, or, as we like better to call them, Flags, and like to have them with us from the first-flowering variety to the time when the last fades on its upright stem. Some of the early-flowering kinds are the dwarfest; perhaps we can find none more beautiful or flowering at a more acceptable time than the Iris primula. Its dark, rich purple tones make a grand bit of uncommon color in the spring garden, and the bulbs are very moderate in price, a few shillings a thousand only.

Some half-shady place may well be planted with the Lily of the Valley. It loves such cool, quiet haunts, and even a small clump is covetable property. These flowers are among the many that become so much more beautiful when planted in such a position. I remember seeing a great clump of these Lilies growing in a neat and precise border of perennials one day last spring; and thought of a picture that I had stored in memory of Lilies of the Valley that once I had seen growing in a clump of Lilac bushes. Those Lilies had quite a different and a far more beautiful effect than those that grew in the border, by reason of their surroundings; and mentally I registered a vow that never would I grow Lilies of the Valley in a perennial border.

Another order of spring-blooming plants of great value are the Alliums, with their blue, white, mauve and rose-colored blossoms.

This bulb is very seldom grown in ordinary gardens, either in town or country. But it is quite hardy, and reproduces itself in an astonishingly rapid manner. It is a delightful subject for a shrubbery border, and especially if the border in question should slope to meet the sunshine.

If we would seek still further to search for spring blossoms that are seldom grown—and there is a great charm and interest in so doing—we may delight ourselves by planting now the old-fashioned Blood Root (Sanguinaria canadensis) with its white blossoms and graceful habit.

I have drawn my pictures as well as I am able, with the hope that they will encourage the novice to go forward with the joyful desire and intention of forthwith possessing himself of a beautiful spring garden.

I would add that in dealing with bulbs, even more than is the case with other plants, it is well to take time by the forelock. I cannot help but feel that those bulbs, and also, of course, other plants that are given a long period in which to grow before they are expected to flower, must benefit by it by displaying a greater vigor and luxuriance of growth and blossom. I like to know that the bulbs, and more especially the small, early-flowering varieties, are safely in their places under the soil. To ensure being able to do this bulbs should be ordered early in the season as delay in delivering often occurs.

There are other plants beside bulbs that make our spring gardens beautiful, and these also must have attention at our hands during the autumn. Seedlings of Myosotis, tufted Pansies, and Polyanthus should now be moved to their flowering quarters. Like the bulbs, many of these spring-flowering perennials flourish and flower luxuriantly under deciduous trees. So few people seem to realise this; we see formal beds and borders planted with these things, while all the time they are far fitter subjects for the wilder portions of the garden, except, perhaps, the tufted Pansies. Let those who wish for really artistic gardens plant their Forget-me-nots and Polyanthus, and many other spring-flowering subjects, with regard to their setting, with a due sense of the fitness of the plant to the position chosen for it, and they will find new pleasure and delight in their gardens, new possibilities, and new scope for their energies.

LAYING OUT A GARDEN.

Masses of color should be the aim in preference to individual plants. It would be a reflection upon the intelligence of the reader to say that the tall-growing subjects should be at the back of the bed, so I will omit the remark and give the names of a few suitable perennials. At the rear, Campanula latifolia and C. pyramidalis will give dark and light blue shades respectively, while C. p. alba is a fine white variety. The Asters (Michaelmas Daisies) will also be found useful, Amellus major (with a large violet-purple flower; Novæ Angliæ roseus (a delicate white tint), and Purity (a white, of large size), being especially good. The first-named will require a position in the centre of the border, being of dwarf habit. Among the varieties of Helianthus, D. Dewar is worthy of mention. The flowers are large, bright yellow in color, and the petals are twisted like those of a Cactus Dahlia, giving the flower a most curious appearance. In front of these we might plant Campanulas in variety. C. persicifolia grandiflora is a large double blue, very useful for cutting. C. glomerata, with bluish-violet flowers in terminal clusters, has a very attractive appearance, and there are also white and pale lilac forms. At the end of the border I would plant a Cytisus, perhaps better known as the Laburnum.

For the front portion of the border there is a host of subjects to select from. We might plant a clump of the Red-hot Poker plant (Tritonia uvaria). This grows higher than the majority of the plants suitable for this position in the border, but a tall pillar of flowers here and there breaks up the level surface, and relieves the sameness of the bed, so to speak. The medium and dwarf herbaceous Phloxes, both late and early flowering, are useful and very effective in clumps. Papaver nudicaule (the Iceland Poppy), with its yellow and deep orange flowers, makes a grand show, and is very useful for cutting. The annual Poppies are also of great service in this border, and, while speaking of annuals, mention may be made of the Antirrhinum. I always have one or two clumps in the front part of the perennial border, and if the flower-stems are cut off when fading, a second show may be expected before the season is over. Spiræa palmata, with its large, palm-like leaves and clusters of crimson flowers, is a grand plant, and one well worth cultivating, as indeed are most of the Spiræe. An edging of one or more of the dwarf Saxifrages will make a good finish-off to our bed. S. aretioides, forming thick cushions of green, dotted over with bright yellow flowers, might be alternated with S. muscoides purpurea, which bears countless numbers of purple flowers. S. oppositifolia is of a dwarf, spreading habit, and bears flowers of a rosy hue.

Really, the number of plants suitable for the perennial border is so numerous that the only satisfactory method of dealing with this portion of the garden is to consult the catalogue of a reliable nurseryman, and select according to one's fancy. A good help in making a selection is to go round your neighbor's garden, make a note of what he possesses, and then buy—something entirely different! There is nothing creates an interest in gardening like the possession of a unique collection of plants. An uncommon plant is always considered difficult to grow by the outsider, and a gardenful of them would have a simply staggering effect, and give the owner a wholly undeserved character for horticultural knowledge.

Dean Hole, in his book, "Our Gardens," gives a very concise summary of what a garden should be—"There should be more grass and less gravel, more flowers and less bare soil, more curves and fewer straight lines and angles, more hardy and not so many half-hardy plants, more arrangement and less disorder, more shrubs (evergreen and golden) to cheer the ungenial day."

H. BRENCHLEY.

GARDEN ACCESSORIES.

ARCHES.

The character of many small gardens depends to a great extent on what I may call accessories. Among them, arches must always hold a high place. Many people will, I expect, by bitter experience, have certain climbers, and noticeably Roses, refuse to flourish when trained to galvanised iron or wire-netting. This fact has been proved over and over again, so that if we decide on having these arches, they should be painted, as the evil effect on the Roses is thus overcome.

For picturesqueness, many prefer wooden arches. If these are introduced into suburban or town gardens they should not be of too rustic a character, as it is out of keeping of the style of the town garden generally; but should be made of wood that has been sawn up by a carpenter, and the arches constructed on the simplest lines possible. There is one serious error that is often perpetrated in the making of arches: they are not made sufficiently high. Both for decorative effect, and for ease in walking under them—even when wearing a high hat—this point should be considered.

Ivy-clad arches are not seen as often as they might be. They are objects that may be enjoyed in summer and winter alike, and on that account deserve to be placed in sight of the house windows. I know one such arch that, in addition to the Ivy, has a climbing Rose to enhance its beauty in summer. The large-leaved and uncommon Irish Ivy has been chosen, and few things that the garden contains are more decorative than this massive archway.

A deep arch, as a porch to the summer-house, makes this a picturesque instead of unsightly object, as too often it is. Ivy, however, should not be used in such a position, lest it tend to darken the interior of the summer-house, but some of the Clematises, a spring-flowering variety, and in conjunction with it one that flowers later in the season, make ideal subjects. Or, again, cluster Roses, and with them some Major Convolvulus—one of the most charming summer climbers it is possible to cultivate—make delightful summer pictures. A long, straight garden path gains immensely in picturesqueness by being spanned by several of these arches, and they are a means of introducing color at a height of several feet from the ground; and at the same time a long line of tubs, well filled with flowering plants, such as Hydrangeas, Agapanthus, Lilies, or even standard and miniature shrubs, is distinctly a decorative feature, especially in those gardens where a certain trim formality is desired to be accentuated. To gain the best possible effect the plants must be in a buoyantly healthy condition, for nothing looks more forlorn than to see starved and limp plant life, so to speak, on show, their roots confined, and unable to seek nourishment beyond the limits of the tubs. Well-cared for, however, these specimen plants are valuable garden accessories.

Flowering Hedges

are seldom seen, but they can become charming features in the garden, and if a hedge is necessary, surely, if it is possible, it is well to choose something that shall lend its quota of color to the general effect. It then answers a double purpose—it forms the necessary screen, and it is a flowering subject.

A low hedge, yet high enough to screen the cabbages from view, may be made by planting Lavender. This maintains its silvery-green foliage, may be allowed to go all unpruned, as it is one of the tidiest and neatest of plants, and if it gets too wide can be cut back to trim neatness again. A hedge of Lavender in full flower is a charming sight—and smell, too—and can be quickly formed. Really large pieces put into the ground will strike root and grow quite as well as small bits of new growth, and within a year a delightful miniature hedge will result. If the cuttings are put in fairly close at the time of planting, alternate ones can be withdrawn the next season to give sufficient room for development.

Spiræa Lumalda, a small, compact shrub, covered with pink flowers in summer, is another admirable plant for the purpose in question. It is very decorative in effect, and blossoms at the time of year when flowering shrubs are scarce. It has the merit, too, of remaining in flower for a long period. This Spiræa is especially suitable for a moist situation, and where the soil is inclined to be heavy and rich.

Roses, again, make an ideal hedge if the proper kinds are selected. The making and training of such a hedge is a most interesting pastime, and, when fully grown, should be a grand feature of great decorative value. Some of the old, but trusty, Hybrid Perpetuals, like General Jacqueminot, or Dupuy Jamain, make a glorious mass of color, while, for length of blooming, few varieties can exceed the Monthly or China Roses. It need hardly be said that one variety only should be chosen. I should imagine that the Hybrid Tea Camoens would be highly successful thus treated, and, for brilliancy of tone and wealth of blossom, hard to beat.

F. M. Wells.

TRENCHING GROUND IN WINTER.

At this season of the year every advantage of fine, open weather should be taken to increase the fertility of the soil in our gardens. The minds of most persons will at once revert to the vegetable garden as being the quarter in which trenching most directly applies. It is an invaluable aid in the kitchen garden, but equally so in the flower garden, and the new beds which are to be devoted to the growth of evergreens and ornamental trees.

By trenching, I mean the breaking up of the soil to a depth varying from eighteen to thirty inches.

The advantages derived from the judicious breaking up of the land are not as yet fully appreciated. Three parts of our garden ground is left untouched from the time the crops are cleared off in the autumn until the warm spring days come round, and remind the gardener that once more Nature is waiting for the sowing of the seeds. And if the surface remains clogged and undisturbed, full crops cannot be produced from the seeds sown, and nothing less than a full crop should satisfy us.

Do not wait until the spring before letting in the air and warmth, as well as the keen frosts, into the land, but commence to trench forthwith.

Trenching should be done well, and not "scamped;" therefore take sufficient time about the work, and if ten rods cannot be properly dealt with in one season, be content to do five, and leave the rest until another winter.

The proper tools to use are a clean spade and a strong garden fork. Examine the surface of this plot before commencing to trench it, and if one part is lower than another endeavor to make any equality good during the process of trenching.

A piece of ground forty feet wide may be divided into two parts, the soil from one half (twenty feet) being taken out and simply placed at the end of the other half; it will then be available for filling in the trench, when the whole piece of ground has been dug. Take one half and trench it through to the other end, and to fill up the last trench bring the soil from the other half. Its removal will open out the trench on the last portion to be dug, which will be finished off by using the soil taken out at the commencement.

By this method very little labor in wheeling soil to a distance is incurred. If, however, the piece of ground is a narrow one, from four to six yards wide, the soil taken out of the first trench may be at once wheeled to the other end in readiness for filling up the hole at the last; thus the whole piece of ground would be trenched in one breadth instead of in two.

The soil in the bottom of the trench should be broken up, but leave it below, and do not bring it to the surface. The top soil ought to be left in as rough a condition as possible; the winter frosts, rains, and air will thus enter in more freely, and, in the spring-time, it will rake down freely, and be in the best condition for the reception of seeds and plants.

Trenching may be done until quite late in the spring, but the sooner after the winter sets in the better will be the results.

Manure may be incorporated with clayey soil at the time of trenching, in the autumn, but it is better to delay the application of manure until the spring where a very light soil is being dealt with.

When trenching ground a note should be taken of the result to the crops.

Delamere.

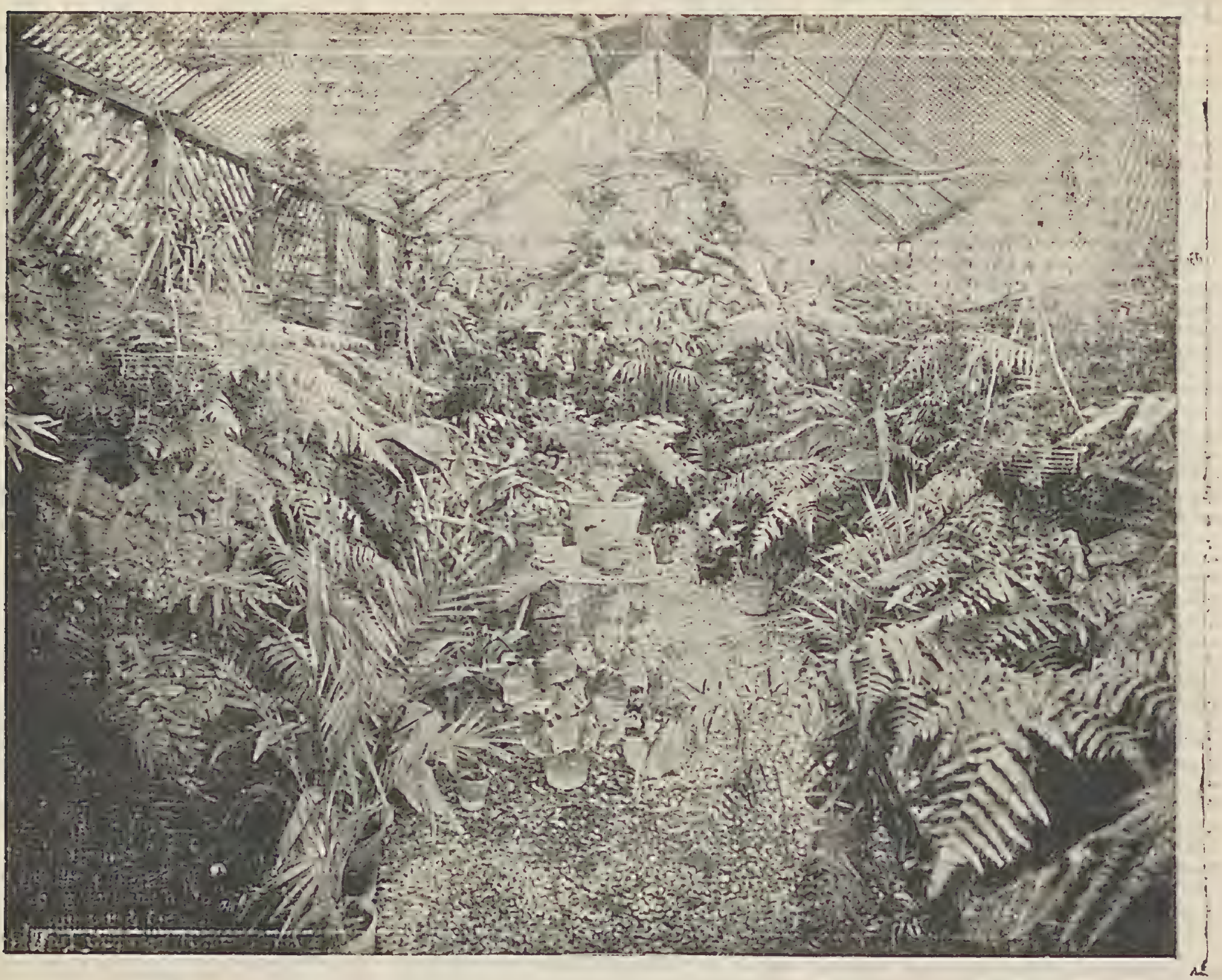
RUGOSA ROSES.

Although the value of the Rosa rugosa has been recognised since its introduction, now a good many years ago, it is rarely that any introduction maintains its popularity to such a great degree as this has, up to the present day. Its well doing everywhere is the main cause of this. It matters not whether in city or country, the growth is satisfactory. Its very good appearance near cities is in a great measure owing to its doing so much better than other varieties in similar situations, and this good doing is no doubt owing to its thick leaves, enabling them to withstand the smoke and dust associated with such localities.

This rose makes an admirable hedge for a boundary line; it is so hardy, so bushy, and so ornamental in leaf, flower, and fruit. It needs but little trimming, only enough to keep it in place, as the plant's habit is to grow bushy and not tall. As a hedge it becomes so broad and bushy in time that a wide space must be allowed it when set. The plants could be set red and white-flowered alternately if desired, as both grow exactly alike.

Propagation of these plants is carried on by layering, by seed sowing, and by cuttings chiefly. Layering is always a sure way, but seed sowing is the best of all. Gather the large pods in winter, pound them until the pulp can be washed away from the seed. Then preserve the seed in damp soil, in a cool place, until spring, sowing it then outdoors as early as possible, and every seed should grow. It is true that rugosa roses give us their best display of flowers in spring, but all through the summer at intervals there are blossoms appearing, even to the last day of autumn.—"Florists Exchange."

A PRETTY CONSERVATORY.



Kentia Belmoreana.

Phœnix Reclinata.

SCIENTIFIC.

The Solanums.

The Solanums have an undivided corolla enclosing the ovary. The stamens spring from the corolla and are as many in number as the flower has lobes. The leaves are alternate, undivided, and without stipules. The calyx remains after the corolla withers. The anthers face inwards. Seeds numerous and flattened.

The genus is well represented in both field and garden. The potato with its underground tubers, or really buds, is a well-known staple article of food. As usually grown continuously from sets it is apt to deteriorate, and needs to be re-started from seeds.

The tobacco is perhaps too well known from its prepared leaves, but an allied species is sometimes seen in gardens, the Nicotiana affinis. This handsome plant has a long tube, adapted for fertilisation by moths, and to attract these the flower is white, and strongly scented, especially at dusk when moths are about. On the other hand, to repel ants and small, unsuitable flies, the stem is sticky and of an unpleasant odor. The plant is generally liberally sprinkled with adhering victims. The tomato, capsicum, Cape gooseberry, egg-plant, and our native kangaroo apple are also articles of food. Belladonna, henbane, and stramonium are used in medicine. In the garden we find Datura, with its large, spiny capsules crowded with seeds; the violet-flowered ichromo; the cestrums; and the favorite florists' flower, petunia. Solanum Wendlandii remains long in flower, and is an effective climber with large purplish flowers.

PYRETHRUM ROSEUM.

This beautiful herbaceous plant is perfectly hardy and of easy cultivation and one that with ordinary care will give an abundance of bloom year after year. It will thrive in any ordinary garden soil and in almost any situation, provided it is given plenty of light; but it responds readily to liberal treatment, and the size and richness of the flowers produced under such conditions will amply repay for a little extra trouble. Propagation is easy, either by division or seeds. If the plants are to be divided, the earlier in the spring it can be done the better, as the plants will receive less check; and if good-sized divisions are planted they can be counted on to flower freely the first season. If propagation is to be effected by seeds, the best time to sow them is just as soon as they are ripe; but the exact date depends on the earliness or lateness of the season. Sown then, nice plants will be procured before autumn, when they should be set where they are intended to bloom. The seedlings should not be left in the seed bed, however, until time for the final planting, but will be much benefited by being pricked out into a bed of well pulverized soil as soon as the seedlings are fit to handle. We find a cold frame an excellent place for this purpose, as here we have the plants under control and can water better and shade easier after planting than can possibly be done in the open ground.

Seeds can also be sown in spring, and although the plants will not bloom the first season they will be larger for autumn planting. Among the old plants we often find a good supply of seedlings from self-sown seed; these are all right to lift and use where colors are a matter of no importance. But we find that the finer varieties do not produce seeds so freely as some of the poorer ones, hence if self-sown plants are relied on the strain soon runs itself out.

In the shades of color, pink predominates, running from very light to very dark. Different forms of pure white are included, also maroon and crimson. These last two shades are the showiest, but are the hardest to procure and the hardest to perpetuate from seed, so that only by careful selection and careful handling can the full range of colors be preserved.

There are some beautiful double forms and varieties which can only be perpetuated by division. A few doubles may be reproduced from seed, but they cannot be depended on to come true, and when a good double is procured the best plan is to keep dividing as fast as possible until a stock has been procured. The flowers are mostly solitary, the doubles nearly always so, but some of the single varieties produce several flowers on one stem.

All of the varieties are admirably adapted for cutting, producing stems of two feet and over which are clothed with graceful feathery foliage; and as the stems are always strong enough to hold the flowers erect they make up a beautiful vase. Their lasting qualities are of the best. In a moderately cool room we have often kept the flowers cut in good condition for over a week.

In the vicinity of New York the plants winter all right without any protection, but we find that for the young plants especially a slight covering of leaves, or litter, is advantageous, and that given this they will start away stronger in the spring than they will do where no protection is afforded.

This winter we tried a couple of plants in the forcing house, lifting them about the same time and giving them the same treatment as we do spiræa, but the experiment was not a success; though we got the flowers all right, they were small, and, in a good many cases, deformed, so we have made up our mind that this pyrethrum will never be much of a success as a forcing plant.—"Florists Exchange."

INDOOR PLANTS.

GRASSES IN POTS.

Where pot-plants are required for decoration throughout the year the object aimed at is, of course, to supply as great a variety as possible. Several of our hardy grasses readily lend themselves to pot culture, and by their means some light and pleasing groups can be formed in the greenhouse during the summer months, added to which they are extremely useful. Being at their best during the summer, just when the greenhouse is usually supplied with a great wealth of flowering plants, these grasses serve to tone down any strong color which often prevails at that season of the year. Where needed only for cutting from, the seed may be sown in the open ground during the showery weather of April, when it will soon germinate and grow away freely. In pots, however, these grasses are most appreciated before the outdoor ones are sufficiently advanced to be effective. To ensure this, a good plan is to sow the seed from the middle of February to a corresponding period in March, according to the weather and other considerations, for should it be very cold and dull nothing is gained by sowing it then, as given bright, open weather it quickly germinates.

There are two methods of treating these grasses in pots, one being to prick them off when large enough to handle, and the other to sow them in pots in which they are to flower. This latter plan is the better, the principal consideration being not to sow the seed too thickly, as when the plants are overcrowded much of their beauty is lost. Pots of any size may be used, but the most useful are those 5 in. or 6 in. in diameter, as they are handier than larger ones. A small amount of drainage, yet sufficient to be effectual, with a good holding soil suits the various grasses. To accomplish this, one good crock in the bottom of the pot is enough, when the soil may be put in and pressed down fairly firmly, leaving in the case of those with minute seeds a space of about half an inch from the rim of the pot, and rather more for the larger ones. Loam lightened with a little decayed manure and sand will form a very suitable compost. The seed having been thinly sown and lightly covered, the pots may be placed in a cold frame and kept pretty close till germination takes place, which, with bright weather, will not be long. Plenty of air should be given to encourage as sturdy a growth as possible, but even then in most cases some slight support will be necessary for the plants as they grow up. The practice so popular with market growers for the support of many plants is to insert four sticks at equal distances apart around the edge of the pot, and pass a piece of stout thread or matting from one to the other, giving it a twist around each stick to hold all in position. If this be done directly the plants are tall enough the foliage which is produced afterwards will hide both sticks and ties, while at the same time the plants will be prevented from falling about. As the pots get full of roots the plants must not be allowed to suffer from want of water, otherwise the foliage will soon get sickly.

Some of the best grasses for this treatment are the dwarf-growing Agrostis pulchella, the taller, yet even more delicate, A. nebulosa, and both forms of the Quaker or Totter Grass (Briza maxima and B. minor). Hordeum jubatum, the long barley-like awns of which are of a purplish tint when young, but when mature soon fall to pieces, will also be found useful. Lagurus ovatus, with its white downy heads supported on slender stalks, also does well in pots, and is very distinct from anything else, while to these may be added the loose-growing Bromus brizæformis. Seeds of the above are readily obtained, and most seedsmen now keep a well-assorted collection of ornamental grasses, as many are available for sowing in the open ground that will not succeed in pots.

EVERLASTING FLOWERS FOR WINTER USE.

Where numerous tall vases require filling for the winter months and suitable flowers are not over-plentiful, various kinds of everlasting flowers and grasses are useful, and make an agreeable change. Honesty ranks as one of the best; the shining silvery seed-pods when prepared are very showy and last a long time in good condition, and it is also valuable in the herbaceous border in early summer, when the purple and white flowers are freely produced. There is only one thing that tells against the growing of Honesty in the herbaceous borders for use during the winter—its untidy appearance after the flowers have faded and when the seed-pods are forming. The remedy, then, is to grow a batch of plants in some part of the kitchen garden for winter use only. With good culture Honesty grows from 3 ft. to 4 ft. high. The plants should be pulled up when thoroughly dry and hung up in a cool, airy shed to dry gradually for ten days, when the outer covering of the seed-pods can be easily taken off, leaving nothing but the shining silvery centre. They should be again hung up in the same quarters until required for use.

The Pearl Cudweed (Gnaphalium margaritaceum) is valuable for winter use, but not often employed for this purpose. The flower-heads are produced on stout stalks from 2 ft. to 3 ft. long; the fully expanded blossoms have their outer petals white, the centre pale yellow; the unexpanded bulbs have a scaly appearance, silvery-white. The leaves are woolly, and should be stripped off when the stems are gathered, hanging the flowers up in bunches to dry gradually in a cool, airy shed. If laid in the sun they dry too fast, shrivelling the stems and discoloring the flower-heads. Beyond its value for winter decoration, this Gnaphalium is much appreciated as a summer-flowering herbaceous subject

Helichrysum is the most common species of everlasting flowers, and probably the most useful of all, as it can be had in such a variety of colors from the bracteatum type, from pure white to scarlet-crimson, with innumerable tints between. They ought to be cut in a variety of stages, from small buds to fully expanded blossoms, to obtain the widest range of variety. Helichrysums are very suitable for small as well as tall vases, and for bouquets and wreaths. The same treatment is required for these as for the preceding in the way of harvesting the flowers.

Rhodanthes are valuable not only when grown in pots, but for winter use in a cut state; being slim in appearance, they lend themselves to tasteful arrangement in small vases for drawing-room decoration. Sown several seeds in 3-in. pots in March in a cold frame, and afterwards planted out in rich soil in a warm position, they grow freely and flower profusely. They can be had in separate colors of carmine, rose, crimson, white, and yellow. The flowers ought to be fully expanded before cut, which should be done with as long stalks as possible.

Winter Cherry (Physalis) is not exactly deserving of being classed among everlasting flowers, although it is a capital subject for winter decoration. The beauty of this plant consists in the bright red cherry-like fruits inside a large inflated calyx. Under good cultivation stems bearing many fruits can be cut from 1 ft. to 2 ft. long, but for keeping during the winter should become thoroughly matured before being cut.

Acrocliniums, rose and white, and the larger variety called grandiflorum of the roseum type, make capital winter ornaments for vases; being single-flowered on long, slender stems, they can be lightly arranged in a mass or mixed with other things. Seed should be sown in a cold frame, the seedlings pricked out in light soil in a frame, and afterwards planted in rich compost in a thoroughly exposed situation. The flowers should be cut when young, as they retain their colors better in that state.

Aphelexis of the macrantha type, cultivated as greenhouse specimens, are most useful in producing flowers for winter after they have served their purpose as exhibition plants during the summer. The flowers last a long time after being cut, and give pleasing shades of pink.

Statice profusa, another pleasing subject, is appreciated by many in a cut state for winter use, as blue flowers, even of the everlasting type, are rare. The flowers ought to be cut before they commence to turn pale on the plant, as the color is better preserved and the flowers fresher too, consequently in better condition to stand the winter months in a cut state.

Bulrushes of both the narrow and broad-leaved types make capital winter ornaments for large halls where an imposing group is required. Mixed with Pampas Grass plumes, Bulrushes have a good effect. When fully in bloom they should be gathered, being cut with long stems, as they are so much more ornamental in that way than when only a few inches long. Many kinds of native grasses can be employed to give a winter effect if cut and preserved at the right time—when fully expanded just before the seeds commence to fall from the heads.

The flowering sprays of the now well-known Lace Flower (Gypsophila paniculata) and Statice latifolia are also very useful when cut and dried for winter decoration. The Sea Hollies (Eryngiums), too, may be cut and dried in the same way.

PLANTS FOR ROCK GARDEN.

Quite a large number of plants of the free-growing sort are not at all fastidious, such, for instance, as the whole family of Aubrietias, a large number of the dwarf Campanulas, a variety of Gentians, while such as G. asclepiadea and G. Andrewsii prefer a moister place and some shade also. You could, however, make a feature of Sempervivums, Sedums, Saxifrages of several sections, the dwarf Irises, such as pumila, nudicaulis, olbiensis, stylosa, and a few of the bulbous Irises, which cannot now be planted, as the season is too far advanced. Other suitable things may be found in the dwarf Phloxes, the alpine Pinks, alpine Poppies and Polygonums, Megaseas, Arnebia, Thymus, Iberis, Tropæolum polyphyllum, Arenarias, alpine Asters, Œnotheras, Anemones in variety, Adonis, a selection of hardy Opuntias, Helianthemums, and many more. Many of the smaller bulbous plants—Scillas, Chionodoxa, Snowdrops, Muscaris, Leucojums, the dwarf Daffodils, and others—if planted in the autumn will produce a fine effect in the early spring months. All this, however, depends upon the extent of the work.

WINTER FLOWERS FOR PERSONAL WEAR.

It follows, as a matter of course, that those desirous of having a supply of flowers for personal wear during the winter can only ensure a continuance by having access to a house properly heated. There are rare exceptions, like the Hellebore, whose pure white blossoms are to be had out of doors in the depth of winter under a handlight, but for a supply of blooms we must look to other things under glass. One of the most useful for making up into sprays, &c., is the Bouvardia. It is with me now in full beauty. There are, for instance, the double white Alfred Neuner, President Garfield, double pink, and singles like President Cleveland, red, and Candidissima, white. Chrysanthemums will naturally suggest themselves to the minds of many, and the later the varieties the more acceptable as the winter goes on—size of bloom is not aimed at so much as neat blossoms for the coat. What neater for wear could one have than the sprays of Chrysanthemum Snowdrop, now so rarely seen? Azaleas, Roman Hyacinths, double Primulas, Cyclamens, Heliotropes, Abutilons, are all suited to the purpose mentioned, whilst Roses in pots or on the roof will provide many choice blooms as the spring wears on. The growing of the subjects mentioned to have flowers all winter entails more in the matter of preparation and providing for a succession than keeping the house up to a high temperature—indeed, it is rather the house where a uniform heat is found where winter blooms are mostly found.—Leahurst.

AUTUMN SOWN ANNUALS.

In these go-ahead days of cheap greenhouses, in which amateurs and others can successfully winter a stock of the orthodox bedding plants, there seems to be a lack of interest in what—to my mind—is a very beautiful, interesting, and useful class of plants. I can remember the first garden that I had charge of; it only boasted two two-light garden frames, and it is needless to say that very little in the way of bedding stuff was stored there for a summer display. Consequently, we had to rely chiefly upon annuals for filling the beds and borders, and I believe that both my employer and myself derived as much pleasure and satisfaction from those "weedy annuals" (as some term them) as many people do from their varied assortment of bedding and subtropical plants.

It is not to decry the latter that I take up my pen to-day, for I am sure our gardens are all the brighter for their presence, but to awaken interest in a rather neglected class of plants. What can be more beautiful than a few well-grown clumps of Cornflowers, and the autumn-sown plants will become double the size of those sown in the spring, and will not so quickly succumb to a spell of drought. Larkspurs, again, are charming subjects, both the branching varieties and the Rocket, or Hyacinth-flowered. They may be had in blue, rose, and white, either separately or mixed. The double Rocket varieties are capital for massing, or for ribbon borders, while the tall branching kinds are very suitable for shrubbery borders, the background of the shrubs enhancing their beauty. Again, what can be more beautiful than some of the newer forms of the Candytuft, especially some of the new French hybrid varieties? Growing from three-quarters of a foot to a foot high, they are charming subjects for small beds. But they are all beautiful, and the only difficulty is that one cannot grow them all.

Sow thinly in rows, six to nine inches apart, in fairly firm, but not over-rich ground. The plants may be thinned out so that they stand clear of each other, and be left in the seed-bed till the spring, or they may, if more convenient, be sown where they are to flower. But where one has the time and convenience the best results are obtained by pricking out the young plants in autumn, when they are about an inch or two in height, into nursery beds, and transplanting them in the spring where they are to flower. To ensure success, it is necessary that the ground should be deeply dug during the winter, and enriched with manure that is in an advanced state of decomposition, such as would be obtained from an old hotbed. Work the surface two or three times before planting, to obtain a fine tilth. Lift the young plants very carefully, so as not to break the little rootlets more than possible, and if the weather is dry when they are being transplanted to their flowering quarters, give them a gentle watering after planting. Light, feathery sticks may be found necessary to support some of the taller kinds, such as the Schizanthus, Coreopsis, Cornflowers, etc., but the less the sticks are in evidence the better, as formality and rigidity are out of place with this class of plants. Appended is a list of kinds suitable for autumn sowing:—Alyssum maritimum (Sweet Alyssum), Asperula azurea, Bartonia aurea, Clarkias in variety, Collinsia bicolor, Candytufts in variety, Chrysanthemums (annual) in variety, Linum grandiflorum, Limnanthes Douglasii, Nemophila insignis, Saponaria calabrica, and S. alba, Schizanthus in variety, Silenes in variety, Virginian Stocks, and Larkspurs in variety.

W. T. Porter.

THE WINTER PRESERVATION OF VARIOUS BULBS.

I well remember a grand lot of Gloxinia bulbs being packed away in their pots between several rows of hot water pipes. They were in a dry enough place, to be sure, and the results were disastrous. When the time arrived for examining the bulbs and repotting them they were quite dead—dry-rot had destroyed every one. There must be discrimination on the part of the grower; Achimenes will withstand a hot, dry place better than Gloxinias, but excessive heat injures these also. They will be much shrivelled when turned out of the pots in spring, and, although not dead, are considerably weakened, and the new growth is delayed.

If placed in a dry corner, where water cannot drop upon the pots—these being turned on their sides and packed one above another—and in a temperature of fifty to sixty degrees, they will keep sound.

Gloxinias require the same treatment, but Begonias should have a somewhat cooler temperature—one which ranges from forty to fifty-five degrees. I have put down a fairly wide margin for the temperature, because the bulbs will not be harmed in the least if the temperature stands at forty-five degrees or so for one week, and degrees higher another. But the bulbs would be injured if a fixed temperature of, say, fifty degrees was maintained in all weathers in winter time.

There may be other precious plants in the same house, which might be spoiled, and the bulbs, being under the soil in the pots, are not subjected to changes in the temperature sufficiently to be affected by them. Moreover, they are in a dormant condition, while the plants in the house are growing.

Withhold water gradually from the soil when the bulbs are ripening. F.

ARTIFICIAL AGEING OF SEEDS.

By Georges Bellair.

From the Revue Horticole, March 16, 1904.

If we wish for certain qualities in some plants, e.g., cucumbers, vegetable marrows, melons, white-headed cabbage, radish, etc., we must use seed two or more years old. This fact has long been known to market gardeners, and others are gradually learning it. It is a custom with some gardeners, if they only have fresh seed to make this "age artificially" as they call it, by carrying it for a certain time in their waistcoat pocket, thus keeping it at a temperature of 70° to 80° Fahrenheit. Some incredulity may be felt at this statement, but it is an old custom, and perhaps none the worse for that.

In 1829 the Bureau of the National Horticultural Society reprinted the following paragraph from the Revue Horticole of the same year:—

"There are still some old gardeners who are in the habit of carrying melon seeds in their pocket for a long time before sowing, and as they do not, and perhaps cannot, explain their reason the younger ones only laugh. This habit seems to result from the observation that some seeds require a certain degree of heat to mature them if they are to produce plants perfectly in agreement with the grower's standard. That is to say, the use of artificial heat is believed to advance a seed one year old to the same stage as one of two years or three years."

The author of this article (whose views correspond exactly with those expressed at the last Horticultural Congress by M. Bazin and others) adds—"It is a fact that many one year old seeds grow more rapidly than older ones, and that fresh melon seeds produce a large quantity of male flowers and few female, while the contrary is the case with old seeds." Again, a report sent in to the Society for the Encouragement of Horticulture in Prussia states—"A fresh melon seed produces about 200 times as many male flowers as female, a seed three years old gives about equal numbers, and a five year old seed all female flowers, which have to be fertilised from another plant. Now, what does really happen to old seeds or to those which being carried in the pocket are kept dry and a sensibly raised temperature? An oxidization of the tissues and living fluids of the embryo takes place, and the latter thus acquires special properties. For seeds live with a slow and almost hidden life, not to be detected by our senses, but proved experimentally by keeping them in a confined place, where, after a certain time, the enclosed air will be found to have lost oxygen and gained carbonic acid, owing to the respiration of the seeds. It is quite probable that this respiration is quickened by a raised temperature, which would explain the importance attached by some gardeners to this habit of carrying in their pocket seeds which they wished "to make old." It would be well not to be in too great a hurry to laugh either at these facts or the expected results, for it would be easy to cite many observations of the same kind which might even appear more unbelieveable had we not learned physiologists to vouch for them. One of the most interesting of these facts concerns one of the mushrooms. M. Tieghem tells us in his "Botanical Treatise," and in his "Researches on the Latent Life of Seeds," that the spores of this fungus will not germinate after leaving their envelope till they have been swallowed by a rabbit and modified by its digestive juices. Having thus acquired germinative power they leave the body in the excreta and at once develop.—R.

BROWALLIA ELATA FOR WINTER.

In the autumn and winter blue flowers are not too abundant, more especially for cutting. This plant, although only an annual, is a most useful blue-flowered plant to cut from. It is of the easiest culture, and may be had in bloom the greater portion of the year, provided seed is sown at different times. It is very useful during the autumn and winter months. When the plants are nicely grown they are useful for placing in vases. Any plant that can be grown quickly and that has such useful qualities should be better known. When strong enough prick out the seedlings, putting three round a 3-in. pot. Place in a close frame for a few days, after which remove them to a warm spot in the open air. When the pots are full of roots, pot into 4½-in., 6-in., or 8½-in. pots, as the case may be. They are then placed in a cold frame, and when the weather becomes too cold and damp removed to a greenhouse shelf, using every effort to keep them dwarf. Should a few be needed early, they are removed into a house with a temperature of 50 deg. by night. The plants should be pinched according to the size they are needed and time they are wanted in bloom. This Browallia is not particular as to soil. Loam, old mushroom manure, and sand, two parts of loam to one of manure, adding sand enough to keep it open, grow it well. —D.

The Orchard.

OPERATIONS FOR JULY.

PRUNING FRUIT TREES.

Pruning is a means to an end. Under natural conditions trees are being constantly pruned. Every fall nature strips the trees of their leaves. This is their regular annual pruning. In addition to this there is a continual pruning of buds and branches. If every bud on the tree were allowed to develop the latter would become a regular bush pile. Those buds which are most favorably situated as regards light get most nourishment, while those less favorably situated become starved and drop off. The lower limbs of trees and those within the crown become weakened and die from lack of sunlight; then the wind, nature's pruning-knife, comes along and removes the dead branch. In this manner, trees are constantly ridding themselves of useless branches, and the pruning so effected is undoubtedly a benefit to the branches which remain, and to the general growth and improvement of the tree. Orchard trees, by virtue of selection, hybridisation, and cultivation, are in a highly specialised condition, and to be maintained so must receive special treatment. In a sense the fruit tree is a machine for manufacturing fruit, and intelligent pruning is one of the means by which it can be made to manufacture the most fruit of the best quality in the shortest time, and to keep up the output for the longest possible period. A correct understanding, therefore of this machine and all its working parts is necessary to its most successful manipulation.

It is as well to begin with the tree from the very start, which is at the time when it is transplanted from the nursery to the orchard, as a good beginning is half the battle. Assuming that a tree is about to be planted out, the first thing to do is to examine the roots carefully to ascertain how they fared in their removal from the nursery, as it is often found that the roots have been badly mutilated, especially in this country, where proper tree-lifters or diggers are seldom used. Before planting all roots which have been broken or damaged should be cut away, and all the young roots cut back to from within 6 to 8 inches of the tap root. All small roots may be removed, leaving only the larger ones, as by digging up a tree which has been planted for some time it will be found, except in very rare cases, that the very small roots never throw out any young rootlets, but wither away and die, becoming a hiding-place, perhaps, for the white ants, which often in time, through such medium, take possession of the tree and cause its ultimate death. The roots should be cut with a sharp knife, and in such manner that when the tree is planted the cut will face downward. By cutting this way, new roots, which will form or rather grow from the cut, will have a tendency to grow in the required direction —downward. The next step to consider is how the top of the tree shall be dealt with. This, of course, will depend largely on the age of the tree in question. If a two or three-year-old nursery tree, it may be advisable to leave either three or four short arms (as shown in figs. 1 and 2), as it is found that if the head is cut away, and only a straight trunk left, the top of the tree may not shoot, but will die, and the tree shoot from the root. This is often the case with the peach, but where a few shoots are left this danger is avoided. If a well-grown yearling tree I would prefer cutting it back to a single stem (Fig. 3). It must be borne in mind always that in moving a tree it loses the greater portion of its roots, and that in consequence the remaining roots are unable to sufficiently support or nourish the growth above ground, for which the whole root system was intended. We must therefore shorten the top in such a way as to re-establish the lost equilibrium, and the planter must bear in mind that it is always better to cut a newly-planted tree back rather severely than to leave it with too much top, as by so doing it will recover more quickly, and in the end make a much better tree. It will be seen by a reference to the figures shown that although the young trees may be about the same size and shape when planted, yet, after the first pruning, they may present the shapes and forms illustrated.

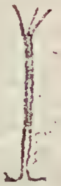


Fig. 1

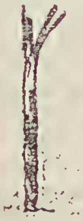


Fig. 2

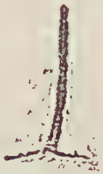


Fig. 3

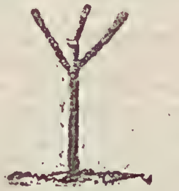


Fig. 7

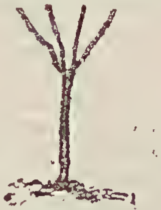


Fig. 8

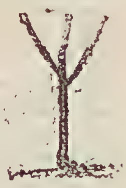


Fig. 9

After the first summer's growth, and before the second pruning, they will present about the above appearance. (See Figs. 4, 5, and 6.)

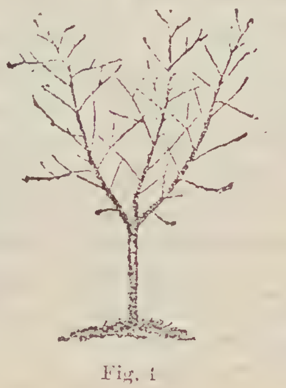


Fig. 4

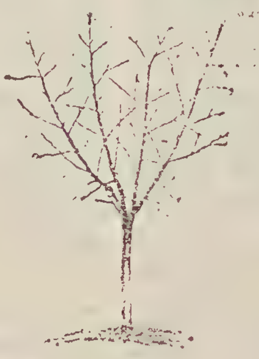


Fig. 5

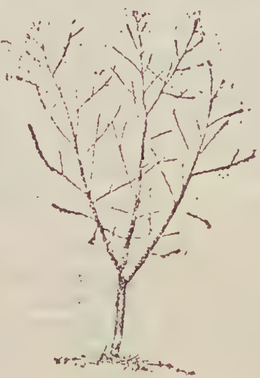


Fig. 6

By adopting a system of allowing only one leader or main branch to grow from each of the shoots (Figs. 1 and 2), and three starting from different points around the trunk of Fig. No. 3, the tree will present a fairly good appearance at the time of the first winter's pruning (that is, the winter twelve months after the tree was planted in orchard form), which pruning will consist in cutting back severely, leaving each arm or branch about 15 inches in length. When the tree represented by Fig. 6 is pruned it will have only four arms left, as shown in Fig. 8; and Figs. 4 and 6 will have only three arms each left, as shown in Figs. 7 and 9. It may be considered by many that this is a rather drastic treatment of young trees, but it must be remembered that while the tree is young our object is to so train it as to produce a well-balanced tree with good strong arms, and that in consequence, until the tree is three years old, our aim is to attain this, which is best accomplished by pruning for shape and strength and not for fruit. In performing the work it is often necessary to prune so as to spread the tree, as many trees are of very upright-growing habit, and therefore it is usually best to cut to an outside bud, cutting the branch diagonally across, as in this way it is more easily severed, and the risk of bruising the back is reduced to a minimum.

During the second summer's growth the tree will require as much labor, or even more, spent upon it in directing and guiding its growth, as, by the removal of certain young shoots and the encouragement of others, the secondary arms can be started from almost any point; and where the trees are given this summer attention the task left for the pruner in the winter is very light. The second winter the trees would present

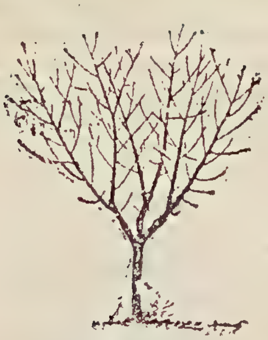


Fig 10

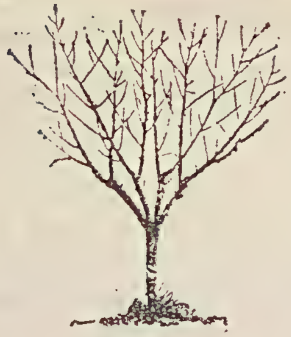


Fig. 11

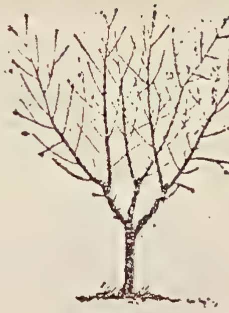


Fig. 12

an appearance similar to those shown in Figs. 10, 11, and 12; and after pruning operations should have the appearance of

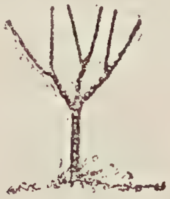


Fig. 13

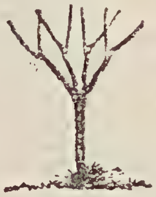


Fig. 14

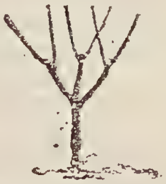


Fig. 15

those shown in Figs. 13, 14, and 15 respectively. When Fig. 14 has four main arms and eight secondary branches, and Figs. 13 and 15 have each six secondary branches, the extreme points of which are now from 24 to 28 in. from the trunk, it will be found that some of the branches are stronger than others, and, therefore, during the summer pruning the stronger growing branches should be kept in check and the weaker ones given more freedom when it will be found that the weaker ones will make up the ground they have lost.

By the end of the third year the trees will have put on a good strong growth, and

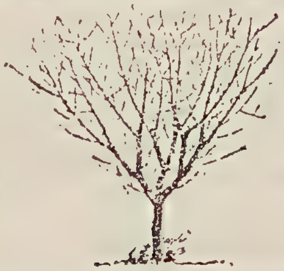


Fig. 16

will be well formed trees, as shown by Fig. 16, and will, when cut back as indicated, present a good strong foundation for the future tree, with sufficient fruiting wood to carry a crop sufficiently large for its age—that is, providing it is a tree that reaches puberty at this age. Many varieties of apples, pears, and other fruits will not arrive at the bearing staga until they are much older.

MULCHING FRUIT TREES, &c., IN WINTER.

We cannot but maintain the opinion, based on many years' experience, that, as a rule (there may be exceptions, of course, as to every other rule), it is unnecessary, and very frequently injurious, to mulch hardy fruit trees, Roses, etc., with manure during the winter. The practice is a common one, particularly in some districts, but that does not prove it to be correct, by any means. The majority of our outdoor fruits, including the apple, pear, plum, cherry, &c., are perfectly hardy subjects, and consequently they require no protection, in principle—in fact, are better without it, in most cases. Beyond this, a mulch of manure. or anything of the kind, excludes from the soil around the trees the undoubtedly beneficial effects of the air, frost, etc., and in the case of a naturally heavy or damp staple, frequently induces a sour and unwholesome condition, which is decidedly prejudicial to healthy root formation and the consequent well-being of the tree. Again, supposing that nothing of this kind occurs, and the tree forms fresh roots freely, the tendency of the mulch is to draw these close up to, or possibly right on to, the surface of the soil; and when the mulch is removed, dug in, or blown away in the spring, leaving these surface roots bare, the natural and only consequence is that they become dried up or withered, and probably killed, by the drying winds of spring or the heat and frequent drought of the early summer—again to the detriment of the trees. Further still, there is nothing worse for fruit trees of any kind than to disturb their roots in any way, as by digging or forking in, however lightly, such a mulch, in the spring—if anything of the kind is done at all, it should be in the autumn, and as early as possible even then. Lastly, there can be no doubt that the proper time to mulch fruit or rose trees, etc., if at all, is in the spring or early summer, and not in the winter. At the former season it checks evaporation, shields the roots from drought and hot sun, as well as feeding them, saves watering, and does good, instead of harm, in every way.

TREES IN DAMP GROUND.

When asked the best trees to plant in wet ground the one addressed has not an easy question to answer. But, in a general way, almost all trees will grow in wet ground, provided there be a good drainage, or enough of it that circulation of water goes on constantly. It is wet ground from stagnant water that kills trees. Our valleys are constant illustrations of this. Water may be above ground in some seasons, especially in winter, yet trees grow there and thrive. In summer, what with the heat and the calls for moisture by the trees, the soil loses enough of the water that solid ground appears, into which the roots spread. As a rule, these trees are surface-rooting, as will be seen when they blow over, which misfortune often overtakes them. Then can be seen a spread of roots, many feet in length, on all sides, but of less than a foot in depth. It is an instructive sight and lesson to view such a blown-over tree. I have seen such trees, of immense size, large forest trees, with roots extending in a solid mass, many feet horizontally on every side, but not a foot in depth.

It is a trouble to start trees in such a situation. The best way is to procure rather small trees with good spreading roots; set them almost on the surface, and cover the roots with soil procured elsewhere. A small tree will not blow over easily, and in a few years, sustained by the soil placed over its roots, it will form new ones, and be in a position to care for itself. It need hardly be added that it is useless to expect trees to grow where water cannot drain away. There must be circulation —"Florists Exchange."

DESIGNING FRUIT TREES.

By C. Bogue Luffmann.

All buds are, at an early period in their existence, in an indeterminate stage—that is, they may develop into flower or wood buds, according to the supply of sap, air, and light they receive. It is a common law of nature for the sap—which is the sustaining and wood-forming substance of the tree—to make the strongest growth where it ascends perpendicularly. Upright growth is, therefore, woody. It is weakness rather than strength which induces fruitfulness, and herein lies the clue to a profitable design. It lies between coarse strength and extreme weakness.

As upright growth is usually too strong to bear fruit, so all wood at a sharp angle from the perpendicular to the horizontal and dependent is more and more inclined to be fruitful, owing to the more moderate supply of sap resting about the buds, and the instinctive weakness of the part.

If upright growth is to bear fruit, it must be light. The trunk being the medium of supply to the super growth, branches placed directly over it are invariably the strongest, the rule being that they weaken according to the angle at which they stand from the perpendicular. In an economically designed standard fruit tree this law is reversed, the strongest branches ranging on the outside, the others weakening in regular order as they near the centre. By adopting this plan one secures a permanently shapely and highly profitable tree, as, where the framework is strong and broad, no difficulty exists in preserving an abundant supply of fruiting wood throughout the entire head; but if, on the other hand, light branches are encouraged on the outside, they fruit prematurely—the strong centre branches draw the sap away to no purpose, further development is impossible, they are quickly exhausted and disappear, leaving the tree in the form of an inverted pyramid, with a close and barren centre, and able to bear fruit over a meagre and unduly exposed exterior.

The size, shape, and fruit-bearing powers of a tree may vary considerably owing to native habit, resources of soil, position, and climate, but the interior economy should be well preserved in all circumstances. An appeal to reason, and the illustrations which, unfortunately, exist in almost every orchard, will show the comparative value of well-designed and irregularly formed trees. We see thick and thin branches of the same age standing at the same angle. One branch with a nest of spurs at its centre, another with a tuft of spurs at its point, or down one side, the other bare. One side of a tree has three thick branches, the other side six or seven thin ones. Many trees have a fringe of fruiting wood near the crown, the inside being absolutely bare. These are not rare but general defects, in every case due to want of design and intelligent handling.

In every subject, there is a type of wood favorable to the production of fruit, at the least expense to the tree, therefore this type should be evenly distributed throughout every part except the main branches.

Where it is in the nature of a tree to make lanky pole-like branches, these must stand well nigh perpendicular, and be of moderate length, or they will not support their crops, and preserve a fixed position. Every branch should be so plated, and given such a degree of vigor, that it will adhere to one position at all seasons, no matter how heavy the crop or wild the storm.

The difficulty of arranging branches is overcome when the resources of the soil and the native vigor and habit of any subject are thoroughly understood. Very few branches are needed, if they are well spaced. Three mains will yield nine secondaries—three light ones inside, and six of much greater vigor surrounding them. (Nine would prove too many in some trees. The age and spread of the tree determine the number of secondaries. They must always be sufficiently far apart to secure light and air on all sides when in full foliage.)

In designing a tree, it is necessary to note if the strongest secondaries occur on the inside or outside of the mains. An examination of living trees will show that nearly all peaches throw their secondaries outwards from the main. Apricots are inclined to spread laterally. Apples and pears are most diverse, each variety calling for separate investigation.

Where secondaries spring outwards it is necessary to carry the mains higher and more perpendicular than when they spring from the inside. But the mains must not be laid in hurriedly, or the sap will be carried to the points, and thus prevent the formation of strong secondaries at base.

Where secondaries spring from inside, the mains are arranged as low and near the horizontal line as they can be conveniently carried without producing weakness and premature decline. Again, strong-growing varieties have their mains and secondaries at a sharp angle to the trunk, whilst weak and limp wood will modify the size of tree and call for more upright growth.

Carry all types of wood on uniform lines. Examples: All mains of equal size, length, and angle from trunk; all secondaries light in the centre and gradually thickening towards the outside; all laterals, shoots, and spurs strongest at the base of a branch and weakening as they ascend to the outside of the tree. All spurs and fruiting shoots at regular distances, established and growing wood alternating, otherwise there must be a feast and a fast through overcropping, or impotence of the light wood.

It is too much to hope that these rules will be literally observed by all orchardists, but the object is to explain the reason why fruit trees should be carefully planned and controlled.

The widest part of a fruit tree should be its base, a foot or so above the trunk. If it is objected that horse implements cannot be used and close cultivation secured, the reply is: Increase the height of the trunk, though not beyond 3 ft., as the climate demands low broad-based trees, which will screen their feeding area from the direct heat and desiccating winds of summer. If there is any equality in the size and position of the mains they should not be called upon to furnish the same number of secondaries. Example: A strong main may furnish three secondaries; another, considerably weaker or more horizontal, should yield two; the latter will then be of about equal size to the three furnished by the stronger main. A decidedly upright but indispensable main may be called upon to furnish several secondaries in order to exhaust it somewhat, after which a secondary or two of suitable size may be selected. and the others pruned away. Secondaries, again, must, in so far as they vary in size and position, be cropped according to their strength, otherwise the form of the tree will become irregular and less profitable. Laterals, shoots, and spurs are, in the same way, formed strong or weak, long or short, single or composite, according to the age and habit of the tree and the class of fruit desired.

The production and maintenance of fruiting wood is assured when the foundation is properly laid, therefore be particularly careful in dealing with the trees during the first three or four years. The right way absorbs no more money or time, whilst it assures the fullest possible return from all trees where cultural operations are well carried out.

TURKESTAN LUCERNE OR ALFALFA.

EXPERIMENTS AT BURNIMA, NEW SOUTH WALES.

Mr. H. T. Edwards, of Burnima, New South Wales, is taking a great interest in the cultivation of Turkestan lucerne, or alfalfa. His property is situated in the Monaro district of New South Wales, and is subject to hard frosts in winter. Learning that Mr. Edwards took an interest in the matter, Messrs. Anderson & Co., seed merchants, of Sydney, procured several samples of the seed and asked him to conduct an experiment for them.

Six different varieties were sown, in drills 4 ft. apart, on the same date and under the same conditions, the particulars of the samples are as follows:

Oz. No. 9359, seed secured from Erivan, Caucasus, Russia. This province is very hot and dry in summer, and very cold in winter, the temperature often reaching 20 below zero.

Oz. No. 9250, from Askabad, Trans-Caspian Territory, Turkestan. This region is very hot in summer, while the winters are comparatively mild.

Oz. No. 9451, from Sairam, Turkestan, one of the coldest regions of Turkestan.

Oz. No. 9452, from Bokhara, Turkestan. This is a region of much alkali, the soil having a white crust when dry.

Oz. No. 9454, from Khiva, one of the driest regions in Turkestan, the average rainfall being less than 3 in. The summers are very hot and the winters cool.

Oz. No. 9455, from Karshi, Turkestan, a town in the mountains, about 80 miles south-west of Samarkand.

At the time of our late visit all these were growing well, and looked most healthy.

Alfalfa will grow in favorable soil anywhere from sea level to 7,000 ft. elevation. Good drainage is necessary, as the plants are quickly killed by excess of water in the soil or on the surface.

Water must never be allowed to stand on a field of alfalfa more than forty-eight hours at a time, for if the ground becomes saturated with water and is allowed to remain for any considerable length of time the plants will be drowned out and the roots will decay. Neither will alfalfa succeed if rock, stiff clay, or other impervious subsoil lies too near the surface. Although alfalfa requires good drainage, it also requires a fairly constant water supply, and is likely to suffer from drought on deep, sandy soil. Alfalfa hay that has been properly cured is eaten by all kinds of farm animals, and has a higher feeding value than red clover. It is also one of the best soiling crops, and may be fed in this manner to better advantage than if the stock is pastured on the field.

The directions for culture by the United States Department of Agriculture in America are as follows:

West of the Rockies it is recommended that the seed be sown in the early spring on land that was fallowed the preceding summer, and left bare during the winter. The summer fallowing, if properly done, will eradicate all weed seeds that were near enough to the surface to germinate, and the land should be put in excellent tilth before sowing the seed in the spring.

In the north central States it should be sown in the spring on land that is as free from weeds as may be, and in an excellent state of fertility. It is well-night impossible to start alfalfa if the soil is not in fertile condition. In the southern States a crop of cow peas should be grown, and either fed down on the land or cut for hay. The land should then be ploughed for a good depth, put into excellent tilth by harrowing, and dressed liberally with the usual fertilisers before sowing the seed. The sowing should be done in late August or early September. If the soil is not in proper condition it might be well to plough under the crop of cow peas, but this should be done early and the land thoroughly rolled and harrowed, time being given for the organic matter turned under to decay before the seed is sown. In the Atlantic States great care should be used to have the land in good heart before any attempt is made to sow alfalfa. This may be accomplished by the liberal use of fertilisers and manures, providing they are free from weed seeds, by catch-crops, green manures, or, if the land is well stocked with humus, by commercial fertilisers, combined with proper tillage.

(To be continued.)

Gathering Apples.—It depends very much upon the season as to the time for gathering. If any apple is gathered before being ripe the fruit shrivels. A good test of ripeness is to pick a fruit from the most shaded part of the tree, cut it open, and if the pips are brown all the crop may be safely gathered.

American Blight on Apple Trees.—Get a little paraffin and daub it in where the insects are. A little later wash them out with clean soapy water, then mix a little soap, clay, and paraffin into a paste, and well daub it into any of the cracks where the insects may be. If any appear later, treat them in the same way.

TREATMENT OF FRUIT-TREES AND VINES AFFECTED BY INSECT PESTS OR FUNGUS DISEASES.

When the plants are dormant, generally bare of leaves, the pests and diseases which attack them are usually dormant also. At this period it is possible to apply remedies of considerable strength, without any injurious effect upon the plants, but which will be quite effectual in destroying all spores of fungi or eggs or larvæ of insects with which they come into contact.

The strong insecticides and fungicides which can be applied with perfect safety to the trees and vines in winter must be greatly diluted and weakened for application when the plants are actively growing.

The first application of full-strength mixture of fungicides should be made as soon as possible after the plants have been pruned or when the limbs and branches are bare of leaves. All prunings should be at once burnt.

The second application should be made just before the buds begin to open.

The third application must be made with the greatly weakened solutions or mixtures when the leaves are upon the trees. Peach and nectarine trees at that time are very subject to injury from too strong mixtures.

If rain should fall soon after the application of remedies it will probably be necessary to repeat them at once.

The winter treatment may be regarded as curative, and the spring and summer treatment as preventing the further spread of any disease germs that may have escaped winter remedies.

As germs or spores of fungi and the grubs, caterpillars, chrysalids, and eggs of insects usually collect under old bark, in crevices, &c., on plants, and are there protected during the cold season, it is desirable that such bark should be scraped off and the lower stems and limbs of plants sprayed with strong kerosene emulsion or washed with limewash.

All rubbish should be removed from beneath and near to trees, vines, &c., because pests of every kind shelter in such places. It is a very bad practice to pile posts, stakes, &c., beneath trees.

In early spring most of the insect pests and fungus diseases begin to multiply in myriads, and as they are then very tender, they can be readily vanquished by the use of proper compounds in solutions. But, as before said, winter treatment is most effective.

For fungus diseases the Bordeaux mixture is the cheapest and best in respect to shothole on apricot, peach, plum, almond, cherry, &c; for curl-leaf on peach, nectarine, &c.; for scab on apple and pear, for powdery mildew on apple and pear, for bitter rot on apples, and for tomato scab.

All insects which gnaw and eat the fruit or leaves of plants can be killed by the use of mixtures containing either Paris green, London purple, or arsenate of lead. London purple is rather uncertain as to the proportion of arsenic contained in it, and liable also to injure foliage. It is always desirable to mix quicklime and molasses or treacle with arsenical compounds.

All insects which live upon the sap of plants, extracted by means of a beak or tube—like those of the aphides, or of mosquitoes, or bugs, or scale insects—can be destroyed by means of resin wash or of kerosene emulsion.

Anthracnosis of Vines (Black Spot).—After the vines have been pruned, make a solution of 7 lb. sulphate of iron, 3 oz. sulphate of copper in 1 gallon of water, and thoroughly swab all new wood that is left on the vines. Remove and burn all cuttings. It is claimed that this solution used in winter is an effective remedy against Oidium.

Collar-rot of Orange-trees.—The diseased bark at junction of trunk with the soil should be carefully removed, and the wound dressed with a 10 per cent. solution of carbolic acid, or with a solution of 1 lb. sulphate of iron in 1 gallon of water.

Aphides on Peach-trees, &c.—Generally these aphides live chiefly upon the roots, and about August, or earlier, they begin to swarm up the stem on to the branches. Remove soil from around the stem until about 9 in. length of the roots are exposed. Swab these roots with tobacco wash, and return the soil, after sprinkling it with about 1 gallon of tobacco wash. Spray the branches either with tobacco wash or resin wash.

Codlin Moth.—Spray during fine weather, after the fruit is formed, at intervals of about two weeks, with a mixture made as follows: Place 1 oz. Paris green in a tin or bottle, with sufficient water to make a paste; cover tightly, and shake well until the powder is thoroughly wetted. Then add this and 1 lb. fresh slaked and sifted lime and 1 lb. molasses to 12 gallons of water, or when fungi are also present, use summer strength Bordeaux mixture, with the addition of 1 oz. Paris green to every 12 gallons. This will kill any leaf-eating insects without injuring the foliage. Scrape off all rough, dry bark, and clean out all crevices and knotholes, catching and burning the scraping. From about November onwards bandage trees with bagging, examine the bandages every ten days, and destroy any larvæ of the moth found in them.

Harlequin Fruit-bug.—Do not provide harbor for them by leaving weeds, piles of logs, &c., near the trees. Place old tins or boxes containing old suet or greasy bones near the trees. The bugs, being extremely fond of grease, will collect in these traps, when they may be easily destroyed. Dense smoke will drive them away from the trees. They chiefly attack apples when nearly ripe.

Red Spider.—Apply flowers of sulphur, same as for vines. Resin wash or kerosene emulsion will also kill them, if well sprayed when the leaves begin to grow.

Pear Mite.—These insects can be destroyed by a thorough spraying on the underside of the leaves with the resin wash, or strong tobacco wash, or soft soap. All fallen leaves should be raked up and burned, and in winter, when the trees are bare, the Bordeaux mixture might be effective.

"Gumming" on Cherry, Apricot, Plum, &c.—Cut away and carefully collect and burn all diseased bark, cover the wound with common white lead paint applied with a brush, and sprinkle the paint with sand. Avoid bruising the bark in any way.

How to Make Bordeaux Mixture.—Procure 4 lb. new lime, 4 lb. molasses (or treacle), 4 lb. copper sulphate (bluestone). After slacking the lime pass it through a sieve into a wooden tub capable of holding 18 gallons. Then pour on the molasses, and next pour on about two gallons of water and mix it all well together. Add 10 gallons water, and let it remain a few hours, but stir well once during the time. Dissolve the bluestone in a wooden bucket containing 3 gallons of boiling water. Next pour the bluestone solution into the tank of the spray-pump or other receptacle, and then carefuly pour in the liquid solution of treacle and limewater, leaving the sediment at the bottom of the tub undisturbed. We have now about 22 gallons of a bright greenish liquid ready for winter spraying, but much too strong for use when the leaves are on the trees. For spring use, whilst the leaves are growing, use 40 gallons of water to these quantities of lime, molasses, and bluestone for apple, pear, and quince trees, and 60 gallons for apricot, peach, nectarine, plum, &c.

How to Make Resin Wash.—Resin, 10 lb.; washing soda, 5 lb.; fish oil, 1½ pints (if procurable, if not use soft soap, 2 lb.). Place the soda in a boiler with sufficient water to allow it to boil freely; when dissolved, slowly add the oil or soft soap, and very gradually pour in the finely powdered resin, and then boil together rapidly for one hour, adding a little boiling water occasionally, so that it does not boil over; then add 50 gallons of water. This is especially effective against all kinds of scale insects. It may be weakened to one-half strength for use against aphides.

How to Make Kerosene Emulsion.—Dissolve half a pound of soap in 1 gallon of water, add it boiling hot to 2 gallons of kerosene. Churn the mixture violently for about 10 minutes with a force pump or large syringe until a thick cream-like emulsion is formed, which thickens on cooling. The agitation is most important, it must be violent. For use add 10 parts of water to 1 part of emulsion.

Tobacco Wash.—Boil in closed vessel 1 lb. strongest tobacco, 3 lb. soft soap in 2 gallons of water, then add 18 gallons of water.

Mixture for Destroying "Cut-Worms."—For the caterpillars which bury themselves by day, but at night come up, and eat the leaves of young vines, &c., mix 8 oz. Paris green, 4 lb. molasses or sugar, 30 lb. bran, with enough water to make a stiff paste. Place about a teaspoonful of this near to each vine, but not touching the stem.

Vegetable Garden.

OPERATIONS FOR JULY.

July is generally cold and bleak, but vegetables of some kind or other are generally available wherever the trouble necessary to grow them has been taken. Probably some of the ground usually occupied by vegetables has not been cropped. When this is the case it would be advantageous to manure and dig roughly, so as to be able to make use of it at the shortest notice. All soft weeds can be dug in, but grass and pests should be carefully dug out and removed.

Asparagus.—Clear away all old haulm and burn it, then clear away any weeds that have grown amongst the asparagus stools, and spread and fork in a good dressing of farmyard manure. A good addition to this manure would be a little nitrate of soda, say a handful to the square yard; but, as it is very soluble and would easily be washed away from the soil by rains before it could be made use of by the asparagus plants, its application had better be delayed until after growth begins in the spring. Any waste salt that may be available, or can be obtained without much expense, if applied to the asparagus bed, would probably prove beneficial. Where asparagus is not yet grown a small bed had better be prepared for planting in the spring.

Broad Beans.—Early sown beans should be making fine growth by this time, if they have been kept free from weeds and have received occasional cultivation. Sow a row or two during this month in order to keep up a succession.

Broccoli.—This is a good time to sow seed in order to raise plants for setting out later on. Sow the seed thinly in drills, and do not allow the seed-bed to become dry. When the seedlings are large enough to shift plant them out in a small well-manured bed a few inches apart, and when they are grown move them to their permanent bed. This seems to be a good deal of trouble, but in practice it will not occupy much time, and the results are likely to be better than from the ordinary practice of moving direct from a crowded seed-bed to the permanent bed.

Cabbage.—Sow a little seed, and carry out suggestions made for broccoli. All these kinds of vegetables—cabbage, broccoli, Brussels sprouts, &c.—need heavy dressings of good manure, and after planting they should be well cultivated, and kept quite free from weeds.

Carrot.—Sow a little seed in drills about 1 ft. to 18 in. apart. Sow thinly, and see that the seeds separate well from one another, for they are very liable to stick together. Thin out the seedlings when they are 3 or 4 in. in height.

Cauliflower.—Sow a little seed and attend to it carefully. Plant out any strong young cauliflowers already raised.

Cucumber.—In warm and well-sheltered districts some seed may be sown during the month under a glass, or even calico, or scrim frame for early planting out.

Capsicums or chili seed may be raised as above.

Egg plants also can be raised under a frame for planting out quite early, but, being tender, a slight frost may kill down young plants if they be left unprotected at night.

Leek.—Sow a little seed, and plant out any young leeks that may have already been raised.

Lettuce.—Sow a little seed in seed-bed. Plant out any good, strong, young lettuce, which may have already been raised for the purpose.

Onion.—Sow largely in well-manured and well-drained soil. If onions are required for pickling sow thickly and broadcast, but if they are required for ordinary purposes sow in drills and thin out well when the onions are 3 or 4 in. or so in height.

Parsnip.—Sow a little seed. The ground for parsnips should be dug very deep, for it is a deep-rooting vegetable, and will grow all the better when the ground has been well dug.

Peas.—Sow largely during this month, say a row or two at a time. Stick young peas soon as they begin to grow, and cultivate the surface of the soil between the rows frequently, without earthing up the plants.

Savoy.—Sow a little seed, and treat as advised for broccoli.

Spinach.—Sow a little seed in drills 2 ft. apart, and thin out the plants when they come up in the rows.

Swede Turnip.—Sow a little seed in drills from time to time during the month.

Tomato.—A few seeds may be sown under a frame in the warmer districts of the State. Wherever there are no frosts tomato seed can be sown in the open ground. In some places plants grow throughout the winter, but do not usually produce fruit until the spring.

Turnip.—Sow a little seed in drills.

A Musical Education for Half-a-crown.

The above heading will, of course, appear to most people as the height of absurdity; yet the absurdity is more apparent than real. It goes without saying that a finished musical education in the regular course cannot be had for half-a-crown, or even with several hundred additional half-crowns; but can it be truthfully said that the person with a sufficient knowledge of music to play accompaniments on the piano or organ, to all the popular songs of the day, has no musical education? Assuredly not. A musical education, sufficient to enable one to play accompaniments to the home frequently, gets and gives more pleasure from the modest accomplishment than does many on whose education large sums have been expended.

To the more modest musical education the above heading applies. Such an education "The Australian Gardener" is now offering its music-loving readers for half-a-crown, believing that it is the greatest benefit we can give our subscribers.

This ready-made musical education consists of Pratt's Chart of Chords for the piano and organ, which is the nearest approach to the ready-made knowledge of music yet attained by science.

It is a short cut to harmony, and is to music what the multiplication table is to arithmetic, a quick method of learning to play the piano or organ without a teacher.

With this chart any one can, with but a small amonnt of practice, become an expert pianist. It is a complete self instructor, enabling any one to play the piano or organ at sight, and to play, without difficulty, brilliant accompaniments to any song ever written. It is valuable to the advanced musician as well as the beginner, embracing nearly every major and minor chord used in music; and is endorsed by teachers and musicians everywhere.

This chart is the practical result of years of study by Charles E. Pratt, the noted American composer and musician, whose compositions have world-wide popularity, and a larger sale than those of any other American or European composer.

Believing that the educational value of this Chart cannot be over-estimated, "The Australian Gardener" has arranged with the publishers to supply Pratt's Chart of Chords (published at 5s.) to its readers at the reduced price of 2s. 6d. each, with 2d. added for postage, and in addition to the Chart of Chords the publishers have kindly agreed to send without extra charge a copy of the Coronation Musical Folio, containing 48 pages of sheet music, and instrumental by popular composers.

Every home that has a piano or organ, especially where there are children, should have Pratt's Chart of Chords.

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The Flower Garden

OPERATIONS FOR AUGUST.

Beds of rich soil for half-hardy annuals may be made up, but next month is sufficiently early to sow them. By making the beds now all weed seeds in the soil will have germinated, and can be destroyed before the flower seeds are sown. Plants, shrubs, and trees of all kinds should be pruned at once, so that digging may be commenced. As digging proceeds sowings of hardy annuals may be made in the overturned soil. Bulbs of Gladioli may be planted for succession flowers. All kinds of hardy bedding plants, including Petunias, Verbenas, and Cupheas may be put out. Plant lawn grasses. Put in cuttings of edging plants as Thyme, Rosemary, Thrift, Fairy Rose, and Lavender. Footpaths and drives should be formed or gravelled and rolled at once. All climbing shrubs should now be pruned and trained, fastening the main leaders close in to the wall or trellis. All borders, whether dug or not, should be kept hoed.

INFORMAL GARDENING.

In many portions of the garden the happiest effects are gained by informal planting, and numerous herbaceous perennials, annuals, and biennials, as well as flewering shrubs and trees, are specially adapted for enhancing the beauty of the semi-wild garden. Until a few years ago old-fashioned Roses, such as Maiden's Blush, York and Lancaster, and the Cabbage Rose, all of which make fine bushes, were rarely seen. The Cabbage Rose stands unrivalled for perfume, and a large bush thickly set with flower spreads its fragrance afar on the summer air. Such great bushes, over whose heads many seasons have passed, may often be found in the humble plot of the cottager, whence, loaded with blossom in "the month of the Roses," they waft a welcome greeting of the most delicious of scents to the passer-by. Many of the more vigorous Hybrid Perpetuals, Teas, and Hybrid Teas, if intelligently treated, will form good-sized bushes, and although the standard Rose as ordinarily seen cannot be commended for artistic effect, such a strong-growing variety as Gloire de Dijon will make a head 5 ft. and more through and afford a pleasing picture, while some of the summer-flowering Roses grown as standards will form enormous heads, beautiful for a few weeks in the summer, when they are laden with countless flowers. The tall-growing Evening Primrose (Œnothera Lamarckiana) is a fine plant for the informal garden, and is very effective, as the sun sinks, grouped at the margin of shruberry and coppice, or in open spaces verging a woodland path. The Bergamot or Bee Balm (Monarda didyma) is valuable for its deep crimson color, and if a large mass 20 yards or so in length, and 3 yards or 4 yards in breadth, is planted, it has a bright effect in the landscape, even from afar. White Honesty (Lunaria) and the single Rocket are two good plants for massing, forming clouds of white if viewed at a little distance. The white Japanese Anemone is an excellent plant for the informal garden, since its flowers are beautiful, and if once well established it possesses suflicient vigor to hold its own in the absolutely wild garden in the face of the strongest opposition. It has been known to conquer even the Coltsfoot, one of our most rampant weeds, where the leaves of the latter were from time to time picked off. Solomon's Seal is easily naturalised in open spaces in woods, and succeeds in moist soil by the side of rivulets. It is pretty when bearing its pairs of drooping flowers, and in the autumn its dying foliage assumes attractive tints. The grand Acanthus latifolius is a noble plant, far better fitted for the semi-wild garden than for the border. Its deeply-cut, arching leaves are perfect in contour and poise, and in vigorous specimens the flower-spikes are thrown up to a height of 7 ft. or more. Perennial Starworts or Michaelmas Daisies are indispensable plants, and the strongest of them will hold their own well in the wild garden. The plants already mentioned do not form a tithe of the strong-growing subjects suitable for use in the informal garden. Attention may be drawn to Erysimum Peroffskianum, an annual with brilliant orange flowers growing from 1 ft. to 18 in. in height, which will succeed on slopes of poor soil if a packet of seed is sown broadcast and the surface soil lightly raked over after the sowing is completed.—S. W. F.

GARDENING IN THE CITY.

We sowed seed this year of several varieties of Carnations for cutting, such as the Marguerite, in pure white; and Vanguard Carnations, in a variety of tints. These plants come in so well in the autumn, when others are over, and a mass of them will make a grand show on our warm, raised border, where few flowers will flourish, as it is usually so dry. Carnations pack so well that they are amongst the best of flowers to send by post, and they do much better in town gardens than many other flowers. For buttonholes they are splendid, as they last so long without fading, and their dainty fragrance is always appreciated. Any young plant which fails to open its buds before the frosts begin, we raise carefully from the ground and pot up, returning to its place in the garden in the early spring without breaking the ball of soil. In this way (with the help, too, of the splendid Malmaisons in spring) we are seldom without a few Carnations. Gladioli do well in warm, light soil, and give no trouble to raise them for the winter and replant, as is necessary in heavy clay. All we do to protect them is to make a little conical heap of ashes over their corms; this shunts off the rain as it falls, and also keeps out the frost. With the advent of warmer weather we take away these ashes and lay down a flat mulch of rich soil in its place, but we never trust anyone but ourselves to do this little bit of work, because gardeners are so fond of their spades, and generally slice off the ashes and the tops of the starting Gladioli at the same time, which is disastrous for the poor things. We take away the ashes with the hand, after loosening them with a small fork, if necessary. Kelway's hybrid Gladioli are extraordinarily fine, and in endless lovely shades of salmon, red, pink, and white. A few of the great spikes, cut, make an ideal bouquet for the hall or the fireplace, in a large vase, with plenty of wild Fern-fronds. They are most accommodating flowers, for they will open every blossom in a room, if cut as soon as the first are expanded, lasting longer in this way than in the heat of the sunshine.

If you want to make your balcony very gay, you should order some Gladioli, and place one corm in each 6-in. pot, with good, light soil, without fresh manure.

CULTIVATION OF ANNUALS.

By Mr. A. McDonald.

Annuals are generally understood to be plants which grow up, flower, yield their seed, and perish the same season in which they are sown. The term annual, though popular, is not by any means correct, as applied to plants. Applied to many things it is simple and clear, but when you apply it to plants you get out of a clear atmosphere into a thick fog. It is quite possible to get two or three crops of what are called annuals in one year, and on the other hand individuals of these same sorts of plants may live under slightly altered conditions any number of years. Plants are living things having no fixed period of life whatever only what the conditions bring about. What is an annual in one place is a perennial in another place, or even in the same place under altered conditions. Take, for example, the well-known plant the Mignonette. In all the catalogues—Colonial, English, French, and German—the plant is put down as a hardy annual. Now, you may get two or three crops of it in one year; and on the other hand English—and I should say Continental gardeners as well—grow plants of it into nice bushes, and some of them live over several years by keeping them under artificial conditions. In North Africa, where the plant is, I believe, native, it grows into woody shrubs. The more you try to get a clear idea of what an annual plant really is the more foggy the whole thing becomes. It is the conditions which seem to determine the issue, and no hard and fast line can be drawn between annuals and perennials.

At a late meeting of this society a remark was made by a respected member to this effect "that there are some plants you can only grow as annuals," and the wheat plant was mentioned as a notable example. The wheat plant is an excellent example of a cultivated plant, and, I think, a very interesting one as well. Wheat grains have been found in the oldest Egyptian monuments—which the "wise men" tell us are older than the creation of Adam—nearly as large as the grains of the present day. Now, it is assumed that a grassy plant like the wheat could only have developed heavy seeds like it has under cultivation and selection, as the heavy seeds entirely destroy its chance of maintaining itself in the struggle for life, so that it could not develop them in a wild state. As the Egyptians and other ancient nations ascribed its origin to the gods Isis, Ceres, &c., it is evidence, I think, that they had no true historical traditions of where it was first found and brought into cultivation, so that it seems to me that the plant must have been in cultivation a very long time before the building of the oldest of the Egyptian monuments, and that altogether wheat must have been cultivated as an annual grain producing plant for many thousands of generations. And yet as far as I can see there is no hard law of necessity making it an annual, and that it can be nothing else. It has always been cultivated in the temperate regions of the globe where the changes from summer to winter, and vice versa, make it an annual, as these conditions make all vegetable growth in the temperate regions to a certain extent annual. You have only got to consider the conditions to be altered, when the plant would be altered too. For instance, if wheat is sown in the autumn, it springs and grows on through the winter, but it does not throw up its flower stems till the advancing heat of spring compels it. During the winter weather it stools out and forms a tuft, a grassy tuft. In a continuous climate like our winter the plant would form a perennial grass, or placed under artificial treatment it might be made perennial. Of course, it would be a foolish thing to try to do anything of the kind, as the plant is so very useful as it is; but it is not the utility, it is the possibility of conditions altering the plant that I am discussing, and a very great deal could be said in support of the view I take, which is that if we cannot grow some annuals into perennials it is because we are ignorant of the nature and wants of the plants, and not from anything inherent in the plants themselves.

But if the term annual is not critically correct it is in general use, for want, I should say, of a better word. Bentham, the celebrated English botanist, divides flowering plants into "Monocarpie" (or plants that only flower once) and "Caulocarpie" (plants which flower more than once). These terms may be more strictly correct than the ordinary ones of annuals and perennials, but the words are not likely to become popular. They are too much of jawbreakers, have too many syllables, and until better words are invented we are justified in using the common terms.

Mankind cultivates plants because they are useful to him, and in the front rank for usefulness, far ahead of all the other cultivated plants, stand the few annuals which form the chief food of man; and it is remarkable that out of the immense number of plants in the vegetable kingdom there should be so few found capable of taking even a secondary place against the old ones handed down to us from remote times. Our present high civilization, great in many things, perhaps, cannot beast of introducing into cultivation any good food plant like wheat or rice. It is highly probable, I think, that the first plants that ever were cultivated by primitive man were annuals, as their cultivation is of the easiest and simplest kind. To sow seed, and reap a crop in a few months, does not require a very large amount of intelligence, although it is evident it could only be done by man, there is no evidence that the apes do anything of the kind, as far as I know. But if our civilization has not introduced into cultivation any good new food plant, it cannot be said that it has failed in introducing numbers cultivated for pleasure. In our times it has grown up to be almost a necessity that people should have flowers in their gardens, and even in their houses, and to supply these wants there has been at least a good try; and in this line I don't think that annuals take the place they do in the food-producing plants, what are called perennials seem to assert their claim to consideration. Although there have been a very great many introductions, there is not such a very great number of what are really well-known popular flowers, which mostly everybody knows, and everybody wants to see in their season. Amongst these are a lot of perennials which flower the first season; and it has become the almost universal practice to grow these as annuals. Where that is practicable, it is the most satisfactory for various reasons. Seedling plants generally grow away freer and better than offsets or cuttings. Seedlings give a better chance of improvement or variation in any particular direction. While young they do not take up much room, as a good number can be raised up to a certain size in a small place, and when done flowering they can be put away out of the way at once, as all that is wanted is a bit of seed to begin again. I refer at present to plants cultivated a good deal in pots—Chinese Primulas, Cinerarias, Calceolarias, Mimulus—these seem to keep their place against all comers. They are popular mostly everywhere, and they do remarkably well in our climates, especially Primulas and Cinerarias. Chinese Primulas are specially nice for winter flowering pot plants, and I think if a little more attention was given to saving our own seed and sowing of it a little earlier than is generally done, an advance might be made with this flower. There is a general impression about that seed of this and other things should be imported. I think that is a mistake. It does not improve seed to come 11,000 miles across the ocean, and through the hot tropics. And our country is a good seed-producing country, better, in fact, than where it comes from, only they go to more trouble in looking after it than we do. Selecting the plants and saving the seed are matters of the first importance. The same remarks apply to Cinerarias. Our own saved seed generally comes freer and grows better than imported. The Cineraria is in the old country a great favorite as a pot plant for the spring decoration of conservatories and greenhouses. Here, in addition to these qualities, it is well adapted for planting out of doors in beds and borders. Care is required in raising and getting the young plants on through the hot weather, but when that is over they should not be too much coddled. Plants for putting out might be raised in beds of good soil planted out 1 ft. apart, and where they could be protected from frost, and in the spring of the year they could be lifted with balls and put where they are wanted to bloom. Calceolarias are rather more difficult to do with us, as they are later in flowering than the Cinerarias, and the petals of the flower are thin and do not stand our hot drying winds. I have sometimes seen some very fair plants at some of our shows, but a house of herbaceous Calceolarias like I have seen in the old country, the Adelaide people have not seen yet to my knowledge. Some of the best of the growers save their own seed, and no doubt improvement in the culture will follow. Mimulus are easier done than any of the above. They are suitable for pots and bedding. Of late years we have Gloxinias grown from seed and flowered the same year. There has been a wonderful advance in this flower since I first recollect it. The flowers have got to be large, bold, and attractive. The plant does not like the very hot weather, but through the mild weather in summer and on into the autumn they do well. Tuberous Begonias if well attended to may be bloomed the same year from seed. They may be had in flower a long time, but I think they are best in the autumn. Few flowers are more popular than the Pansy among English people. Strictly speaking, it is a perennial plant, and it likes a cool climate, but with us it is best treated as an annual. The seed may be sown about February in pans or boxes, the young plants pricked off when large enough into a bed of good soil in a sheltered place, where they can be attended to for water, &c., and when the rains come they can be planted out where the are wanted to bloom. Perhaps as an annual there are few things to beat for general usefulness Phlox Drummondii. It suits our climate remarkably well, and may be had in bloom the greater part of the year. It seems strange to me that so much seed of this fine annual should have to be imported, as colonial seed is really so very much better; there is, in fact, no comparison. Stocks are well known to all English people that take any interest in flowers. I have an impression that they are considered common; if they were to be rechristened with a more classical name perhaps they would be more admired than they are, for they are massive, beautiful, and deliciously scented when well grown. They should be sown if possible where they are wanted to bloom, but if that is not practicable they may be sown in beds of very sandy soil in March or the beginning of April, protecting them from heavy rains or too much wet in any way. When strong enough they can be planted out where they are to bloom. A very pretty class of annuals are the everlastings, especially the Acrolinum and Rhodanthe, our climate suits them well, and mostly any one will be pleased with them. Then there are the Balsams and Coxcombs, it used to be a great thing in the old country to grow these well. Here they are getting more attention of late, and as they do well in the open borders if they have good rich soil and plenty of water, they are well worth a little trouble. In my young days the China Asters were reckoned the very cream of autumn flowering annuals, and I suppose they are still. Florists have improved them very much since then. Our summer is too hot and dry for them on the plains; in the hills they do better. I have not had much experience with them, but I think they may be had on the plains at times when they are better understood. Then there are our Zinnias, Marigolds, and Gomphrenus (Globe amaranths), which do well and do not require any particular care, but, of course, do better where they are well cared for; but the magnitude of the subject of annuals quite appals me. When I undertook this paper I had no thought of doing anything but discussing the very critical point as to what constitutes an annual proper, and I think now it would have been better if I had stuck to that; but to make the best of a bad job I don't think I can do better than draw attention to the illustrated catalogues of the seedsmen; they are full of information, and as it is all got up as a matter of competition in business, it is as well done as it is possible to be. Even the seed packets, a good many of them at least, are covered with information; the danger is, I think, that this sort of thing will be overdone; it belongs to the cramming system of the age; there is no lack of information from many sources, only in cultivating annuals or any other sorts of plants it is not what you know, or what you think, it is what you do that is going to have any effect. To achieve success hard work is necessary, and the best sort of knowledge as an aid to that is that gained by observation and experience. If a person has the cultivation of any particular plant at heart, he will cultivate it well if he has never read one word about it; on the other hand, he may be crammed with information and yet do nothing. I think it would be an advance if people were encouraged to think for themselves and act on their own honest opinions, and not trust too much to current literature, as a great deal of it is a repetition of the same thing over and over again. More satisfaction, I think, would be gained by thinking and acting independently.

CULTURE OF NARCISSUS.

The first thing to do is to get suitable soil. Any good ground will do, but some soils are better adapted for the purpose than others. Bulbs will thrive in light or heavy land, dry or wet land, provided there is no stagnant water at the roots.

The best soil of all is a good deep medium loam, and a south or south-west aspect if sheltered will answer as well as any. If the land hangs to the north the blooms will be earlier, but the bulbs do rather better if not exposed to too much direct sun in the middle of summer.

The soil should be deeply worked, not so deeply as to bring up a lot of poor subsoil, but deep enough to prevent the bulbs suffering from drought during the summer. Work with the spade in preference to the plough. Spade work is better, it is generally deeper, and leaves no smooth bottom to prevent draining, as is the case in ploughing. When the ground is well worked down, mark out the piece in beds.

There are various methods of planting; some plant in much the same way as you would plant potatoes. This suits very well for such large bulbs as Sir Watkin, Emperor, etc., but for medium and small bulbs the following will be found the quickest and cheapest plan:—Having marked out all the beds in the piece by notching the edges of the paths, dig out the soil from the bed at one end to the required depth, caryring in to the other end of the piece to fill the last bed. Prepare the bottom by working it with a spade or fork, then put in the bulbs regularly and firmly, so that they will not be thrown down in covering them. Plant not too deeply. If the top of the bulb be covered two inches it will be found sufficient for the smaller kinds, and three or four inches is ample for the larger varieties. The bed having been all planted, it may then be covered by digging out the ground from the next bed and throwing carefully over the bulbs. When this is done the second bed is ready for planting, and so on through the whole piece.

Having planted the bulbs, which should be done at the latest by the end of March, there is nothing to do but to keep the ground clean till they bloom in September or October. This is best done by passing over them with a Dutch hoe several times, before the green points come too near the surface. A good plan especially wet ground is during June to cut out the paths, to the depth of five or six inches, and throw the ground over the beds, in this way killing any small weeds there may be. At the same time the sunken paths will act as so many drains to take off the surplus water. Another way to keep the ground clean is to give it a good covering of seaweed; this also serves as a manure.

The bulbs begin to bloom very early in the spring; in fact, before spring begins, some few varieties blooming throughout the winter. I have known the Paper White to commence blooming in March, and continue in bloom throughout the winter. It is quite usual for such varieties as Soleil d'Or and Double Romans to commence at the end of June.

During the flowering season the bulbs should be gone over at least once a fortnight, to dig out any stray bulbs of other kinds that may be among them. If this is not done carefully the stocks will soon get mixed, and, therefore, practically unsaleable. Care must be taken during the flowering season that the bulbs do not get overgrown with weeds, as these will dry the ground and stifle the foliage. Any injury done to the bulb during its growing season, after the flowers are off, will spoil the flower crop for the following year, as it is during the summer that the bloom for the following year is formed.

As soon as the leaves have died down the bulbs are ready for lifting. It is not necessary to dig most bulbs every year; they will do very well left for two or even three years in the ground, providing the soil is good, and not allowed to get foul with weeds. But for some of the more delicate varieties, and if the bulbs are required for sale, in which case a fine, plump, round bulb commands the readiest market, lifting every year is advisable.

In lifting, care should be taken not to prick the bulbs with the fork, as the least injury will cause some varieties to rot. If the bulbs are to be left out on the ground, they should have a slight covering to prevent them scorching. When storing the bulbs, take care not to mix the various kinds; let each lot be labelled, and put them in a dry shed, if possible. When well dried they may be separated, sorting them in two or three sizes, and having all ready to plant again as early as possible.

In the case of delicate varieties, such as Obvallaris, Sulphur Crown, etc., plant, if possible, in ground quite near to narcissus.

As regards manuring, I find it answers best to use little manure directly to the bulbs. Grass ground, grass fed off and manured regularly every year, is the most suitable, but when this is not available, use land that has been well manured for the previous crop; or, if manure is really needed, well decayed farmyard manure may be used, care heing taken to bury it well away from the base of the bulbs; they, being deep rooters. will find it when they need it. Bone meal is also very good.

Narcissi suffer from several diseases; some go bad with rust at the base, and others will rot off completely at times without any apparent cause. I can suggest no remedy, but if the directions as to their culture which I have given are followed I think it will go a long way towards preventing the troubles.

Now as to which are the best sorts to grow, I will suggest a few names, but cannot give a list of all the best varieties.

If flowers are needed as early as possible grow the well-known varieties I have mentioned before—Paper White, Double Roman, and Soleil d'Or.

Then in August you can have Double Daffodils, Princeps, and Obvallaris or Tenby, and among any dearer aorts, Henry Irving, Golden Spur, and Countess of Annesley.

September and October are the principal months for narcissi. Then you have nearly all the different kinds in bloom, some of the best market varieties being Bicolor, Horsfieldi, Incomparabilis, Sir Watkin, Princess Mary of Cambridge, Barri, Conspicuous, Cynosure, etc. Then the Pœticus section, represented by Ornatus and Poetarum; these are among the best for market purposes. Ornatus especially is one of the finest blooming varieties grown; its pure white flowers, coming so early, are always in great demand.

Among the later sorts are Emperor, Empress, and Grandee. I should have also mentioned the Orange Phœnix and Sulphur Crown, and also Polyanthus Grand Monarque, and the latest of all, blooming in November, the Double White Narcissus. Of course there are many more kinds, some catalogues naming 200 or 300 varieties, but the really valuable and distinct kinds are not nearly so numerous.

Great care should be taken in gathering and packing the flowers, as it is no use growing them well if they are to be neglected in the end. When gathered, stand the flowers in water, taking care that the blooms themselves are kept dry, and leaving them in water till packing them in boxes the morning of sending. Bunch carefully twelve in a bunch, leaving the stems as long as possible. It is bad policy to shorten them, as buyers are always anxious to get long stems. Pack in the boxes supplied by the salesman, in a single layer, not in two or three, as is sometimes done. This is the cause of many of the complaints of flowers arriving in a damaged and heated condition.

To keep the flowers from shaking and getting bruised in transit fix a piece of wood across the box, pressing firmly on the stems where they cross in the middle of the box. If these precautions are taken and the boxes firmly bundled together there will be fewer complaints of the flowers arriving damaged.

A word or two as to forcing before I close. Plant the bulbs in boxes or pans in February, stand them outside, covering with ashes to keep them cool. As soon as the points show through the ashes may be removed.

Double Daffodils, Princeps, Tenby, Golden Spur, Sir Watkin, and Ornatus are amongst the best varieties for forcing.

Double Daffodils, Princeps, and Tenby may be taken into the forcing house in June, care being taken not to get the temperature above 50° till the buds are well advanced. The other sorts may be put in early in August, giving a supply of good flowers during the coldest months of the year.—E. T. Wheadon.

A "Fern Ball."—Would you please tell me the proper treatment for a Japanese Fern Ball? I bought it three months ago, and started it by soaking in water for three hours. I kept it in a shady position indoors, but the fronds all died off after reaching a length of one and a-half inches or so. I now have it outdoors in a shady spot, but the dying-off process still continues. I water the "Ball" twice a week. The "Ball" is a large one, but the buds are very few and far between.—E. D. May. The fault probably rested more with the "Fern Ball" itself than with the treatment. These, charming thongh they are when well-grown, require to be procured and started early in the season—when newly imported—then they usually do well. But when they have been lying about for several weeks or months in a dry warehouse or shop they naturally lose much of their vitality, and then either refuse to start at all, or do so only very weakly and reluctantly. We have bought them early in the season and had excellent results, while a few weeks later, with the same treatment, they have failed, more or less, to start.

PROTECTING ROSES.

The recent spell of wintry weather must have made many rose-growers feel anxious as to its probable effect upon their plants, especially Tea Roses. Many are the devices of the cultivator for keeping the frost at bay and providing protection during the winter months. Plenty of dry leaves or bracken is the remedy advised, but where the latter article is not readily obtainable, there is a very good substitute. It is the long rough cocoanut fibre refuse from 4 in. to 6 in. in length, which, if carefully spread between the rows of our Tea Roses, affords them a splendid protection, as the fibre in this condition throws off the heavy rains and does not, like the ordinary fibre, consolidate, which is a most important factor. This long rough fibre is sold by weight, and as it is very light a considerable quantity can be obtained for a few shillings. I should much like to know whether any of your readers have tried this stuff as a protective, and if so, with what result?—Fibre.

THE GLOXINIA. (Sinningia speciosa.)

Gloxinias are in nearly all colors, from light rose to dark purple, and in the better strains many of them are beautifully shaded and striped. As a house plant for summer blooming, or for greenhouse decoration, the Gloxinias have few if any superiors. They require little care, except in watering, and during the winter they are dried off and packed away. They are readily grown from seed or by means of leaf cuttings, but when only a few plants are required it will be as well, even for the florist, to buy one-year "dried roots." These should be potted at the end of winter, in three or four-inch pots, according to their size, the top of the bulb being just level with the surface, and placed near the glass in a temperature of 60°, where they will have a little bottom heat. Until the leaves start, very little water will be required, but from that time it should be gradually increased, giving the plants all they can use, as if at any time they are allowed to wilt the flowers will be much injured. Gloxinias do well in a compost of two parts of rotten pasture sod and one part of well-rotted cow manure to which enough sand is added to open up the soil. Instead of the rotten sods, equal parts of garden loam and leaf mold may be used.

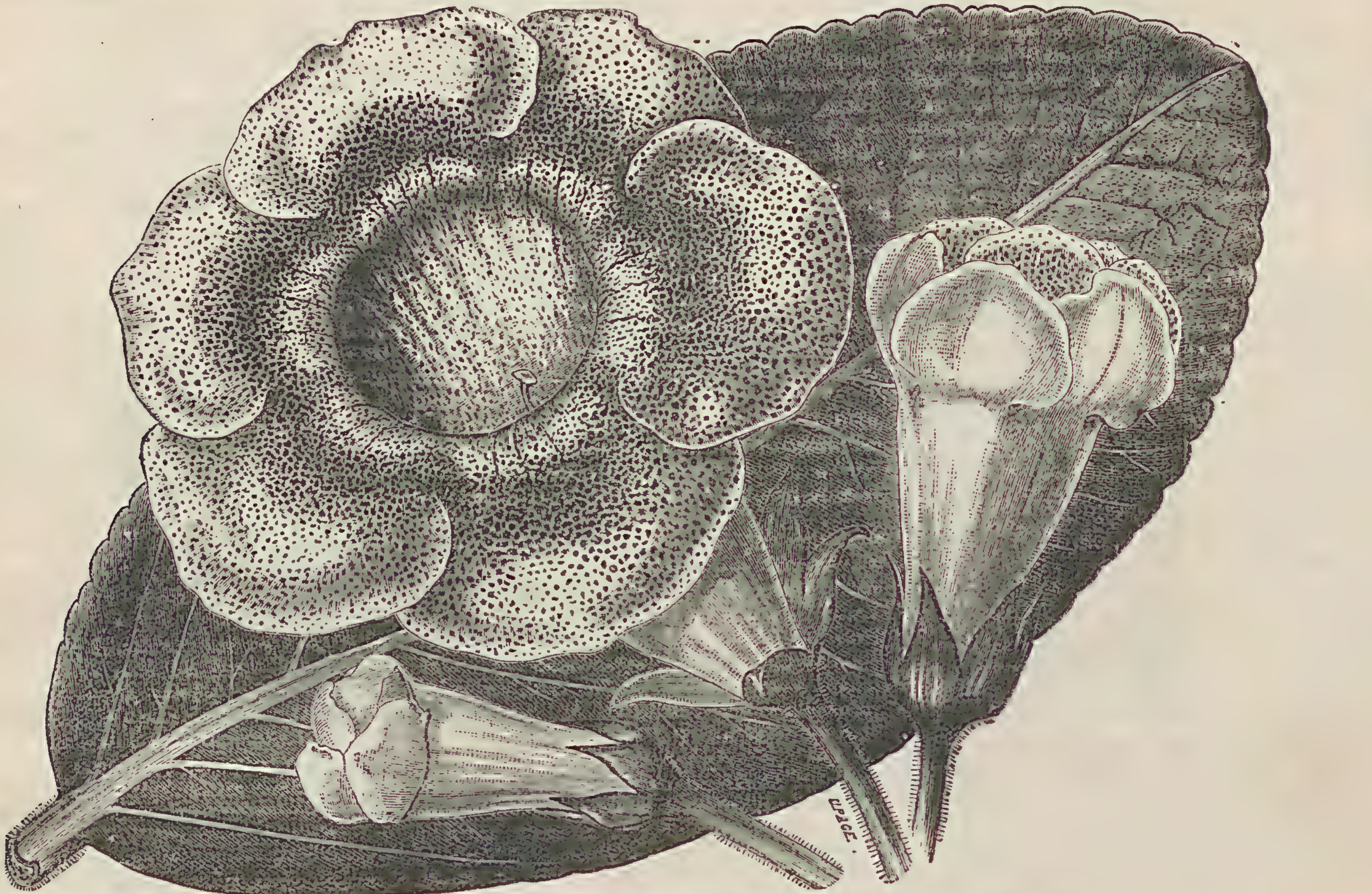
Mr. A. H. Evans, who has favored us with photographs of his Gloxinias, writes—"The larger plants in the pictures are about four or five years old, and were raised by me. When the photos were taken one plant had 40 blooms of fine, large, perfect flowers, and another 27. Both my man and self are amateurs at growing plants, but do not experience any difficulty in starting Gloxinias. They last for weeks in bloom, and are greatly admired by all who see them. I have no very special house for my Gloxinias. This coming season I hope to flower about 150 of them. "Range View" is situated about seven miles south-east from Angaston.

Thorough drainage should be given by filling the pots two-thirds full of charcoal or broken crocks, covered with a layer of sphagnum. As soon as the leaves extend beyond the edges of the pots the plants should be shifted to the five or six-inch size, in which they can be flowered, or sold as house plants. If designed for use as cut flowers, they can be planted out from the small pots, or the boxes, in which they may be started, either on benches in the greenhouse or in frames outside, where much less care will be required. When thus grown they should be mulched with sphagnum.

During the season of growth every precaution should be taken that they do not receive a check. While the atmosphere should be kept moist by syringing the walks and benches, overhead watering or syringing of the plants should be avoided, as, if drops of water remain on the leaves they will be spotted, and their beauty will be marred, if they are not entirely destroyed. On warm, bright mornings a fine spray upon the leaves will soon evaporate, and,

while being beneficial to the plants, will do no harm. They should, at all times, be shaded from the direct sunlight, and during the hottest part of the summer, in addition to the wash upon the glass, a lath screen, or cloth shade will be desirable. Ventilation should be given in good weather, but strong draughts of air should be avoided.

In case anyone desires to raise the "bulbs" from seed, the following brief directions may be of value:—Sow the seeds in August in pans or in pots drained as above; the soil should be the same as for the bulbs, except that no manure should be used; cover lightly, and, after syringing, shade and place in a room with a temperature of 65° or 70°. The seeds will germinate in about two weeks, and the plants will then need careful attention to prevent damping off. When large enough, they should be pricked out in flats, placed in a brisk bottom heat, and later on transferred to pots. Repot finally to the three-inch size, and give the same care as large plants; by the end of January they should come into flower. When growth is over they should be dried ofl and stored for winter.



GLOXINIA HYBRIDA ERECTA.

BEGONIAS.

Having been a successful Begonia grower for some years my experience may be of some interest to your readers. In my opinion, Begonias are far in advance of a good many other kinds of bedding plants in many ways. Firstly, in the simplicity of their cultivation; secondly, in their beautiful foliage, and, lastly, in the beauty and variety of their blossoms, and their long flowering season. Begonias are more easily cultivated than some people may think. Of course, the bulbs are obtained from seed, but for a cottager, such as I am, the easiest way is to obtain a couple of dozen of good bulbs from a nursery—doubles and singles for preference—and propagate from cuttings; in a few seasons you will have a good stock. You should obtain your bulbs during the winter, from a reliable man, and store them in a cool, dry place, in silver sand. They should be looked at occasionally to see if there is any dry-rot among them, and if any is found they should be removed, for fear of infecting the others. In the spring, as soon as any growth is detected, the bulbs should be removed to a cold frame and placed about four inches apart in a nice, sweet, loamy soil, with the crowns just below the surface. Of course, the frame should be covered at night to prevent any harm from frost. I have tried starting Begonias in both cold and hot frames, and I have got the best results from those started in the cold frame, for although longer in starting they are not checked when they are bedded out.

During the period they are in the frames water must be given carefully, the soil being kept just moist, but not wet, or they will rot; they must be kept in the frame till all fear of late frosts is gone and the bulbs are well started, and then it is time to bed them out. Now is your chance to take cuttings. When you take them out you will find some of the bulbs carrying as many as four or five, or even six, shoots apiece. I never bed out a plant with more than two or three shoots on the largest bulbs, and the smallest I only allow to carry one. The remaining shoots I break off, taking, of course, the weakest, and letting the strongest remain, taking care to have a heel on each cutting. These shoots I stick in a shaded border (facing south, for preference), about three-parts of the shoot being buried in light soil, and watering rather often in dry weather, and I have never had one single shoot die, which shows there is not much difficulty in striking Begonia cuttings.

The best place for a Begonia bed is on a southern aspect, in a spot that gets very little sun. The soil must be very rich—I don't think you can easily put in too much manure, for they are rank feeders. Then the plants must be bedded out about 18 inches apart—no nearer for good result—and before the plants grow large I get a little moss-litter manure from some stables and mulch all over the bed, so as to keep any sun from the roots, and the soil moist. When the plants are flowering care should be taken to pick off all the blooms as soon as these show signs of being over, as this prolongs the season, and the plant carries more and finer flowers, which ought to last till the frost comes, when the bulbs should be taken up and dried. Care should be taken in drying, as on this depends the safe storage of the bulbs. The cuttings will by this time have formed small bulbs, which should be treated in the same way as the larger bulbs, only keep them separate in another box. I hope this modest article will induce more to go in for the growing of this handsome bedding plant, and if they follow out what I have said they will be gratified with the result.—A. G. Shand.

WATERING POT PLANTS IN WINTER.

To keep plants in a healthy condition watering must be carefully attended to at seasons of the year, and during the winter it requires additional care. Many plants will take even more water than during the summer. This, of course, applies to those grown indoors where shading is used in summer and little or no fire-heat given. At this season of the year many subjects are liable to get dry beneath while the surface may appear moist, particularly where plants stand on stages where the heat is beneath, and when once they get very dry at the bottom the best way is to dip the pots, so that the soil may be thoroughly moistened through. With some soils it seems almost impossible to get the water to pass through from the surface when once it gets very dry.

Many Ferns are very deceiving with regard to taking up water. A. Farleyense, if in a healthy condition, will take up a quantity of water, and if not carefully looked after it will suffer before it is noticed, for it is the under fronds which go first. I have previously referred to the necessity of giving careful attention to this Fern, and it cannot be too often repeated, for I believe inattention to watering is the chief cause of failure. Excess of moisture is equally damaging, and with plants that are in an unhealthy state it is better to keep them a little on the dry side than otherwise, but with vigorous, healthy plants there will be little fear of over-watering under ordinary treament.

Palms and other subjects where the syringe is used freely will not be so liable to get too dry, but even these plants may be found quite dry beneath when the surface is moist, and those standing nearest the pipes sometimes do not get so much water from the syringing as those where they do not dry so quickly. Palms, like Ferns, often get over-watered, especially when standing on a moist bottom, but in the winter where much heat is given they may require more water than during the summer.

During the winter months it is one of the most important points in plant culture to keep the roots in a healthy condition, and this can only be done by careful attention to watering. Over-watering will sour the soil, while the other extreme will cripple the roots. It is therefore necessary to give careful attention to watering, and this will ensure the plants being in a condition which will cause vigorous and healthy growth when the season comes round for making a start. Much time is often lost in the spring through plsnts having been neglected during the winter.—A. Hemsley.

Specific directions as to watering that will suit every case, cannot, of course, be given. To say nothing of the likes or dislikes of various plants and different methods of pottings, there are always the texture and class of soil to be considered. A man who is used to his soil and knows well the plant he is growing can look through the ball, so to speak, and by a quick method of observation and rapid judgment forms his idea as to whether the plant needs water then and there or will wait another day. Several things influence his decision—the length of time the plant has been potted; whether the pot is full of roots or not; the plant itself; is it a thirsty subject or the reverse? The man who is to do his work expeditiously and correctly has to quickly consider these and other points as he pauses between each plant. All growers of plants know my meaning who have had years of experience in this branch of gardening. Eye and hand have to be trained to work together, and the mind must be quickly made up. A single mistake is not fatal by any means, and to water a plant a day too soon or leave it a day too long is not going to do it any serious injury. It is when these mistakes are being constantly made; when the plant is being watered in driblets day after day until its roots are sickened and die that trouble ensues. If a plant is dry enough to need water at all it needs a thorough soaking that will last a day, a week, or a month, according to the state of the weather, the temperature, and the condition of the plant itself as to growth or rest.

Supplying water to large specimen plants in pots and tubs requires a deal of care. Here, again, the silly plan of driblets daily is often practised, and a worse does not exist. Plants properly potted of such kinds as Azaleas, Camellias, and various hard-wooded species will not pass the water so freely that it goes through with a rush to the floor, but it percolates steadily and surely through every inch of the compost, and when the operator sees it trickling ont of the holes at the sides and bottom he may take it that plant has had sufficient to go on with for a time. A good test is the time-honored one of tapping with the knuckles and noting the sound before watering, and should a doubt then exist the weight of the pot is the safest test.—H.B.

CHINA ROSE—MADAME LAURETTE MESSIMY.

If I were asked which was the most free-blooming Rose in my garden I should not hesitate to name this variety. One of the earliest to expand its blossoms, it blooms away uninteruptedly until hard frosts prevent the buds opening. I have six plants of this Rose in a small bed, which was well prepared for their reception, and each plant is now a large-sized bush. Raised by Monsieur Guillot, of Lyons, as the result of crossing the old China Rose Rival de Pestum and the Tea Rose Madame Falcot, this variety was really the forerunner of a new type of Rose, from which other splendid kinds have since been obtained. It has been largely used for bedding and massing, and this can hardly be wondered at when its many good points are borne in mind. The flowers are only semi-double, in color a pretty shade of rose and salmon-pink, shaded at the base of the petals with yellow. Madame L. Messimy is a wonderfully vigorous grower, hardy, and possesses most elegant foliage, which, when young, is a vivid blue-purple. Monsieur P. Guillot, writing some years ago in reference to this variety, gives some interesting particulars about a fine specimen of this Rose:—"In a certain Normandy estate," he writes, "a Rose bush of Madame L. Messimy, planted in a very favorable position, in rich soil, reached (in the space of two years), a height of six feet and three-quarter inches, and a circumference of more than thirteen feet one and a-half inches about four feet from the ground—forming a round bush from the base upwards. Its vigor is such that on one day in early summer its owner counted more than 450 buds on the point of opening, and a multitude of others to follow." From my own experience, I can testify to its extraordinary freedom of blooming. The only fault I can find with it is that the flowers are rather loose, and do not, in consequence, stand rain well. As previously mentioned, several varieties have been raised from Madame Laurette Messimy. The best of all is Madame Eugene Resal (a most glorious variety, even better than its parent, although not quite so robust a grower, or so hardy). It bears a profusion of rich, rosy-pink flowers, shaded with orange, still further enhanced by the lovely deep-colored foliage. The importance of only planting free-growing and continuous-flowering Roses in gardens where cut flowers are in much request is apt to be overlooked. For this purpose, and also for garden deorations, those China Roses are inimitable, but they must on no account be hard pruned. I have proved that the let-alone system of pruning is the best, just cutting out the weakly branches, and leaving the strong, well-ripened shoots at their full length.

Reducing Growths of Rose Polyanthus Grandiflora.—This is probably one of the most vigorous of ramblers, and is a fine variety where unlimited space is at one's disposal. But its tremendous exuberance of growth will quickly smother other good things. The best plan is to cut away about half of the number of growths, retaining those well matured, and, if possible, having some laterals. A plant of this Rose last season growing in the open border, and one large growth being allowed to arch over produced a number of laterals that yielded fine trusses of blossom. This one growth alone was a perfect picture, so that you may even reduce the number of growths in spring to two or three, provided they are well hardened. Each season, as the numerous sucker-like shoots appear, reduce them to about two in their earliest stages. Such growths as you leave for flowering should be left unpruned beyond shortening back each of the laterals to about three or four inches. These main growths, by suppressing the laterals, will be induced to lengthen. This Rose is somewhat tender, which proves it to be not a variety of R. multiflora, or, at least, it has some of the Tea or Noisette blood in it.

Saving Petunia Seed.—When the pods of the Petunia are ripe they should be gathered and laid out on a piece of paper in a tray or box to further mature and dry. When quite ready and dry, the seeds are easily secured and cleaned, and may then be packeted till required for use.

CULTIVATION OF THE PELARGONIUM.

By Mr. John Everest.

Having been asked to write upon the "Cultivation of the Pelargonium," I will endeavor to jot down a few facts learned from my own experience. They are a valuable and hardy class of plants, and I think there is scarcely any one class so showy in its various colors or so interesting as a collection as these when in bloom. I class them together as Shows, Fancies, Small-flowering, and Regals. They all require about the same treatment in cultivation, but most of the Fancies are the easiest to manage; they are the most floriferous, but not so showy in themselves as the other varieties. To make it properly understood I think it best to begin with the soil. I consider that the soil best adapted for Pelargoniums should consist of one-third good turfy loam, pulled in pieces; one-third black soil or peat (being a substitute for leaf-mould); and one-third well-rotted cow manure, with a dash or two of chemical manure, which gives a rich, healthy, green look. When these are well mixed together the soil is ready for use. I do not use sand, as it is not wanted; and another reason is that the tender roots in working through sharp sand get bruised. There is this objection to sand, that the soil being open it requires so much more watering, which runs the strength out of it. Many gardeners are of opinion that one potting is sufficient, but I believe in second potting. Pick out nice sturdy young plants from the rooted cuttings in 4-inch pots, and for the first shift they should be put in 6-inch pots; this should be done early in April. See that the drainage is good before setting the plant in the pot; put in a little rough moss or cocoanut fibre on the drainage, then throw in some soil, cram down well, add a little more loose soil, and then set the plant in. It should be sufficiently below the rim of the pot to allow a layer of soil over the ball, leaving one inch for watering. A ramming-stick should be used, one end being flat, and the other round and level. Pelargoniums should be potted very firmly. The second shift should be into 8 or 9-inch pots, thoroughly clean, these being large enough to grow on a good plant. Use the same soil. Before placing in the plant throw in a handful of bonedust, as this is an excellent thing for bringing color in the flower. See that the plants are well ready for their potting up. They should not be left to get at all potbound; but if potbound separate the roots carefully with a pointed stick so that the plant will not lose much time in getting a fresh start. After this potting good attention should be paid to the tying-out and stopping of the shoots. Short sticks can be used for a time, and then a wire frame can be placed around the pot. If this is properly carried out there are not many sorts which require the knife much next season. Smoke them once a week if there are any signs of fly.

Watering.—This is an important matter, andis not always properly managed. There are many bad effects caused by mistakes in watering. If overwatered plants become very sickly, and remain at a standstill for some time, and the foliage becomes spotted and unhealthy. Some growers tap each pot with the knuckle, and it is astonishing how soon one gets used to the ring, and is enabled to tell whether the plant requires watering. White on the foliage is often caused by sudden changes, and by the water resting on the folaige when the sun is shining powerfully on the plants, or too strong manure water will have the same effect. Do not apply manure water for a week or so after freshly potting, especially when potted the first time. Care should be taken when plants are setting their bloom to be very sparing with manure water, as when hurried on in this stage the pips will turn yellow and drop, or when opened they will be deformed. When the plants are in bloom discontinue manure watering altogether, as the flowers will last much longer: syringed overhead once or twice a week late in the afternoon keeps the foliage clean and the pores open. Choose a dry day for syringing. The house most suitable for growing is a low spanned-roofed one; the plants being grown close to the glass, they can be grown dwarf. If beds or benches are not high enough for the plants, they can be raised on pots, and also when coming into bloom can be lowered to draw the flower well above the foliage if required. Allow plenty air night and day.

Shading.—We cannot get all through the season without shading a little. There are different shades used—whitewash, tiffanyf calico, etc. Calico with rollers is a good shade, as it can be worked to suit the weather. There is one great fault in using blinds on houses—they are rolled down flat on the grass, the circulation of air is stopped, and the glass becomes very hot and hurtful to the plants. I should recommend to have rollers mounted on a rod about nine inches above the glass, giving space for air between the blind and the glass, After these plants go out of flower they can by turned outside. Choose rather a shade place for a few days, and then afterward. expose them in the sun, still giving them water. They are often neglected and dried off so suddenly that many die. Pelargoniums should be cut back early in March, and they are then ready for a new starts The cutting back should be done with care. Where they have been allowed to grow up rank shoots they have a hard struggle to break when they should be only six or seven inches high. When a plant has been properly grown and tied out the knife need only be used to thin out and tip back shoots. This should be done when the wood is thoroughly ripe and the weather still and dry; put them in a shadehouse and sprinkle them lightly twice a day until they break nicely. Then they can be brought into the house, and will soon be ready for shaking out and fresh potting. The roots can be pruned back a little where they are strong. Pelargoniums are easily propagated by cuttings, and some of the weaker kinds of the Fancies are better grafted on the Show varieties. To make good plants this should be done after being cut down, when the sap is rising. There are many points to consider if intending to show at exhibitions. Some sorts are no. worthy, having a bad habit of growth or being shy in flowering. The pollen should be removed to keep the flower clean, and some gum dropped into the calyx to keep the petals from dropping.

SCIENTIFIC.

The Composites.

The Composites are so called because the flowers are gathered into a compound head; but although this is their chief characteristic it must not be supposed that all flowers so grouped belong to this order—the Scabious, for instance, is not a Composite. In further description, it may be said that the corolla consists of a single tube, that the ovary is below this, that the anthers cohere by their edges, that the seed is single, and that the leaves are generally alternate. In the early state of the flower the style is short, and the anthers shed their pollen into the tube formed by their cohering edges. At a later stage the style increasing in length pushes out the pollen and exposes it for visiting insects to carry about on their feet. As the flowers crowded together mutually protect each other, and as the whole head is often surrounded by hard, spiny scales, there is no need for a number of separate green calyces for protection purposes, but they are utilised in another way. They split up into a series of fine, radiating hairs, and serve as a veritable parachute to float away with the adhering seed. The outer petals are often greatly enlarged, and serve as flags to attract the notice of passing flying insects, which by rifling the flowers for their honey, or by merely walking over the surface, effectually perform their unconscious work of pollination.

As there are about 10,000 species of Composites it is quite to be expected that our gardens are largely indebted to this order. We have the Sunflower with a disc more than a foot across, furnishing seeds useful for the poultry yard and for oil; named, according to some, from its resemblance to a flaming sun; according to others, from its supposed habit of turning to the sun (French, tourne-sol). It is evident to any observer that the heavy, foot-across disc does not follow the sun, but is generally found with its back against the prevailing westerly wind. Not to compile a long list we will merely mention the Chrysanthemums of various types, Dahlias, Cornflowers (some of delicate scent), the showy Gazanias and Gaillardias, the Daisies, Helichrisums and other Everlastings, the Golden Rod (a favorite with Americans), and the elegant, but little grown Humea.

The prevailing colors of the Composites are yellow and white, but Agathaea and Felicia are blue, and Asters are of various colors.

Among useful plants we may mention various herbs, Tarragon, Tansy, Camomile, &c.; Salsify or vegetable oyster, Artichoke, Lettuce with its opium-like juice, and Pyrethrum, the base of the insect powders.

The weeds are numerous enough:—Inula (stinkwort), Hypochaeris, known as "flat-weed," "cat's ear," "conqueror;" Helminthia, or ox-tongue, easily recognised by the leaves being covered with stiff bristles springing from tubercles; the many Thistles; and the Cape marigold which, however, is much relished by cattle.

The Orchard.

OPERATIONS FOR AUGUST.

Finish planting all kinds of deciduous fruit trees at once. Manure and trench land intended for orange and lemon trees, the planting of which should take place towards the end of August. It is advisable to break up the soil at once to admit as much of the winter rains as possible, so as to make sure that the subsoil is well soaked. Finish pruning all deciduous trees. Early varieties of apples and pears may be grafted. Manure and dig orange and lemon trees, taking care not to work the manure into the soil near the trunks, as this often causes stem decay, besides harboring insects which injure the bark.

PRUNING.

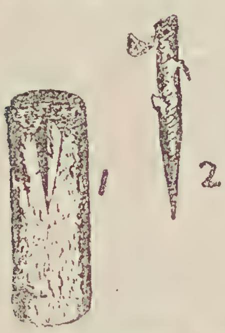
"One of the first things for the beginner to undertake, as he approaches the practice of pruning trees and vines, is to form some conception of the purposes to be served. Imitation is not the foundation of intelligent pruning, though it yields many valuable suggestions. Satisfactory work rests upon a correct understanding of the reasons for each act, and to the attainment of this all study, observation, and experience should tend. Possessing this, one can proceed capably, modifying method to meet condition. and producing desirable results. Receive all suggestions, and then go quietly to the tree and study your problem in its shade. The tree is the best revelator of its needs. Some of our best pruners are men who were untrained to horticulture before they entered upon their orchard work. Reading, discussion, systematic instruction, are all valuable. They save much time and many errors; but recourse to the trees affords the sovereign test of attainment. These may be counted among the practical purposes to be attained by pruning—(a) Convenience of the grower; (b) health and strength of the tree; (c) regulation of heat and light; (d) attainment of strong bearing wood; (e) attainment of size in fruit; and (f) promotion of regular bearing." On examining the tree, it will be found to be composed above ground of a trunk from which the main branches spring, which, in their turn, produce the laterals, on which the shoots and spurs which bear the fruit are to be found. Taking these points into consideration, one can hardly fail to secure rays of light upon the subject of pruning which seem dark to so many. Convenience.—Trees which branch near the ground are most quickly and cheaply handled in all the operations of pruning, spraying, fruit-thinning, and picking. Low trees, with obliquely-rising branches, are more easily cultivated than any form with horizontal branches, unless the head is carried so high that the teams pass easily under the tree. To do this sacrifices all the other conveniences and economies which actually determine profit, and is really out of the question from a commercial point of view. Health and Strength.—It is imperative in most parts of this State that the sunshine be not allowed to touch the bark during the heat of the day. This protection is secured even for young trees by low branching. The low tree, with properly spaced branches attains superior strength by virtue of thick, strongly knit, short growth between branches, and by its strong, stiff, obliquely-rising growth sustains weight which brings horizontal branches to the ground, and thus even high-headed trees are liable to continually increasing interference with cultivation, and the desperate grower has to raise the head of his tree higher into the air and farther above the profit line, while at the same time he renders its more liable to sunburn, to bark-binding, and to unthrift by forcing the sap to flow an unnecessary distance, and through wood and bark which impede its movement. Besides, a low tree escapes stress by strong winds which a high tree invites, and at the same time is less able to withstand. Pruning for health and strength of the tree also includes the removal of unthrifty or diseased parts, which are not only an encumbrance to the tree, but may communicate to other parts the causes of their ill condition. Heat and Light.—The maintenance of strong-bearing wood in the lower part of the tree is conditioned upon the proper pruning of the top of the tree. How far the upper levels or the shade layer of the tree can be safely opened depends upon the local climate in each fruit region. The rule must be the higher the summer heat the denser the tree—the lower the heat the thinner the tree; but everywhere the proper condition of openness must be constantly in view in pruning. Not alone must this be done to maintain thrifty growth below, but it is also essential to the best growth and ripening of the fruit in the lower and interior parts of the tree. Fruit inferior in size, color, and quality results in part from lack of pruning to regulate the admission of light and heat, sometimes one, sometimes both, to the shaded portion of the tree. Bearing Wood.—Good fruit develops on good bearing wood, and good bearing wood is the product of proper degrees of light and heat as has just been urged; but bearing wood in the case of some fruits is new wood, and the reduction of old wood for the purpose of forcing the growth of new wood must be constantly in mind. Renewal is more or less a consideration with all trees, and especially in securing of strong new wood. This is a point upon which close study of the bearing tree will yield most satisfactory suggestions. Size of Fruit.—The size of fruit, providing the tree is healthy and vigorous, depends upon the character and amount of bearing wood which the tree is allowed to carry. Removal of part of the fruit burden is done by thinning after it is well set, but this labor should always be minimised by antecedent pruning, which adjusts the retention of bearing wood, according to the vigor, size, and bearing habit of the tree. Thinning out of bearing shoots and spurs, when either are clearly seen to be in excess, should be the constant study of the pruner. Regular Bearing—This point is largely involved in the preceding, and affords an additional incentive. Regulating the amount of fruit borne in one year involves the profit of two years, because a tree cannot produce an excessive amount of good fruit and perfect buds for the following year. It may generally make buds which will bloom, but not always that. If it does make the bloom, it is no guarantee that the bloom will be strong and effective for bearing. Consequently pruning for reasonable amount of bearing should always be borne in view, and should be practised at the close of the year of non-bearing with particular diligence, if the alternate year bearing habit is to be broken up."

The foregoing are among the practical purposes to be served in pruning, and it will be seen that there are various ends to attain; therefore have an ideal towards which to work, and always have an object in view when severing branches, shoots, or spurs from any portion of the tree; never by any chance losing an opportunity of picking up any points from your neighbor. The form of tree which in New South Wales has been found to give the greatest satisfaction is the low vase form (sometimes called the goblet form), and which shelters the fruit as well as the trunk, and also the ground in the immediate vicinity of the tree from the hot summer winds and sun, and minimises their effects. In pruning for this form the central branch is cut out, and the tree is so formed as to leave the centre of the tree quite open, and the fruiting wood is so guided that the centre, as well as the outside and the bottom as well as the top, has plenty of room and light to develop good fruiting wood in every portion of the tree. In confining the tree to this form it may, to a certain extent, tend to give it a dwarfed appearance; but this is of little moment in comparison with the many advantages which trees so trained possess over the high-stemmed open-centred, long-limbed shape in our very hot districts. The weight of the fruit is borne by strong, sturdy branches, which will not bend and swing with every breeze that blows, and while the fruit may tend to spread the main branches a little, even this has no ill-effect, as the young growth found shooting out of the branches and laterals is sufficient to shade the interior of the tree to such an extent that no harm befalls it. It is well to see that the main branches do not start from the trunk too close to each other. It is best to start them from different points, radiating around the tree and at equal distances apart from each other.

GRAFTING.

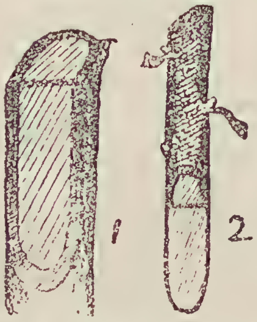
The time for grafting deciduous fruit-trees is approaching. Grafting was referred to in the writings of Pliny and other ancient authors. It would appear, however, from their writings that the principles were very imperfectly understood, or they would not have entertained the belief that the vine could be grafted on the walnut or cherry, the peach on the willow, or that black roses would be the result of grafting pink roses on the black currant. Having no natural affinity, these plants can never form a vital union, however accurately they may be mechanically joined. The mode of grafting practised by different persons are numerous, but they all depend upon one principle, which should be well understood by every one who possesses a garden. No matter how skilful the operation of grafting may be performed, the results will be unsuccessful unless the stock and scion are nearly related, such as varieties of the same species, species of the same genus, or genera of the same natural order, beyond which the power does not extend. Much as is pratically known with regard to the species and varieties that will agree with each other when grafted, there is still much to be learned, which can only be acquired by long experience and observation. The influence of the stock upon the scion is often very marked. This chiefly arises from the stock supplying the scion with a greater or less amount of nourishment than it would receive from its natural root, and consequently producing a more or less vigorous growth. Too great a disparity between the nature of the scion and the stock should be avoided if a steady growth be desirable. It should be remembered that wood does not unite with wood so as to form a vital union in any case. After trees have been grafted for many years, it is found on dissection that between the portions of the wood of the stock and scion, which were placed together at the time of grafting, no union has ever taken place; when all the wood subsequently formed is removed the parts previously joined can be readily separated, exhibiting two clean surfaces, or, occasionally, with a little dead, cellular substance interposed. It is, therefore, evident that the pieces of wood already formed do not unite, however accurate they may be joined.

Whip or tongue grafting is, on the whole, the best and easiest mode of grafting, and the one most extensively employed for young trees in this country. It is represented at figure A, where 1 is the stock and 2 is the scion. It will be readily understood that the bark of the stock, because older, is thicker than that of the scion, consequently if, as ought to be the case, equal surfaces of the wood are exposed, the cut surface of the scion would not completely cover that of the stock, nor would this ever be the case, except when the barks of both stock and scion are of equal thickness. In proceeding to operate, cut the top of the stock in a sloping direction, as shown in the figure, terminating, if possible, above a bud. Then take the scion and cut it sloping and thin towards the end; next enter the knife and cut a thin tongue upwards, as shown in the figure. The scion is now prepared. Then proceeding to the stock, cut a slice upwards, so that the surface of the wood shall be as nearly as possible a counterpart of the exposed wood of the scion. In the upper part of the cut make a notch to receive the tongue of the scion; this notch should be kept open with the point of the knife whilst the tongue of the scion is being inserted. The inner bark of the scion and stock should be placed in contact, the parts secured by tying with matting or other material and surrounded with clay, grafting wax, or other substances, to exclude the air and rain, then the operation is complete.



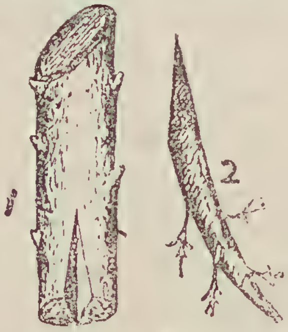
A —Whip or Tongue Grafting.

Cleft grafting is represented in figure B, where one is the stock and 2 is the scion. This is sometimes called triangular notch-grafting. Instead of splitting the stock a triangular notch is cut in the side, and in that the scion is fitted, so that the inner barks correspond. The scion is kept in position by tying matting or other material round it and the stock. It is then surrounded with clay, grafting wax, or other substances to exclude the air and rain, and the operation is complete.



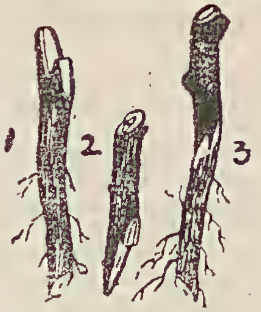
B.—Cleft Grafting.

One way of root grafting is represented at figure C, where 1 is the scion, and 2 is the root. There are other ways of root grafting, the tongue or whip graft being largely practised. See figure D, 1, 2, and 3, where 1 represents the root, 2 the scion, and 3 the graft complete. The scion should be tied, clayed, &c., as in those above referred to.



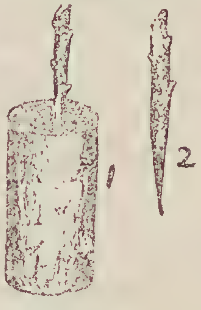
C.—Root Grafting.

Crown or bark grafting is represented at figure E, where 1 is the stock and 2 is the scion. This mode of grafting is easily performed by any one. The head of the stock is cut horizontally, and a slit where the scion is to be inserted is made just through the inner bark. The lower end of the scion is cut sloping as in whip grafting. A piece of wood, bone, or ivory, in shape somewhat resembling the thin end of the scion, is introduced at the top of the slit, between the alburnum and the inner bark, and pushed down in order to raise the bark, so that the thinned end of the scion may be introduced without being bruised. The edges of the bark on each side are then brought close to the scion, and the whole is bound with matting, and clayed. If so desired three or four more scions can be put into the head of a stock if it is a large one. On the whole, crown grafting is not so good as whip or tongue grafting, but it answers well for working superior varieties on such established trees as are not fruiting satisfactorily. Crown grafts are very liable to be blown out if care be not taken to cut the growths back, and support them in some way whilst they are young.

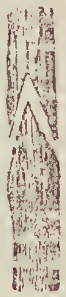


D—Root Grafting.

Saddle-grafting is sometimes practised (see Fig. F., where 1 represents the stock and 2 the scion). It cannot be satisfactorily carried out, however, unless the stock and scion are of nearly equal thickness. The stock is cut sloping on both sides like a wedge. The scion is split up the centre, and each half is thinned to make it astride the wedge-like end of the stock. The inner bark of the scion and stock having been made to coincide as nearly as possible the parts should be secured by a ligature, and covered with some grafting composition, then the operation is complete.



E.—Crown, or Bark, Grafting.



F.—Saddle Grafting.

Notwithstanding that some varieties of fruit-trees, especially pears, bear unsatisfactorily in some situations, many persons hesitate to do anything with them, and allow them to cumber the land for years without giving an adequate return. Should such trees be in a healthy condition, this state of affairs could be easily remedied by cutting the branches well back and grafting scions of good bearing kinds on them. Fig. G is a representation of a tree that had been subjected to the treatment suggested.

G.—A Pyramidal Pear Tree Regrafted.

In cutting wood for scions the greatest care should be taken in selecting only those portions which are thoroughly ripened and have the buds well formed. The stocks, too, should be sound, vigorous, and healthy. Unless these things are taken well into consideration it cannot be expected that a healthy union will take place. Healthy scions that are grafted on unhealthy stocks, or vice versa, will never give satisfaction, no matter what attention is given to their cultivation.

NOVELTIES OF GRAFTING.

PICTURESQUE AS WELL AS PROFITABLE.

Millions of dollars have been added to our horticultural interests by the graft which has incidentally given pleasure and satisfaction to thousands of those who live among their orchards and make them contribute to their support. Not more than half a century ago the secrets of budding and grafting trees were considered so sacred that none but a professional gardener or scientist was supposed to possess and utilise them; but to-day our fruit orchards and shade trees are budded and grafted with new varieties by the humblest of farmers and horticulturists. While the secrets are no longer in the possession of the privileged few, their full value is appreciated by but a limited number, and, consequently, the art or science receives only half the attention it deserves. The graft furnishes us with the key for horticultural novelties that should add improvements to every small suburban place, no matter if not more than half a dozen trees can find a precarious livelihood on it. The pleasures derived from changing the nature and characteristics of the trees are no less of use than the development of virtues of new varieties of fruits through systematic budding and grafting. The ugly stump of an unproductive tree can in this way (writes a correspondent of the "New York Times") be converted into a thrifty bearer of fruits; the semi-wild sapling with its thorns and tough fruits may be made to bloom as a garden with luscious varieties of pears, apples, or peaches, and the tree which yields sour, puckery fruits can be changed as if by magic into a producer of sweet and juicy crops.

The magic of the change can be used for ornamental effects as well as for utilitarian purposes. The pear tree which yields its single crop of Bartletts may be changed into a many-headed variety, yielding late and early pears, large and small, green and blush fruits. The plum tree or cherry can likewise be made to produce half a dozen varieties on as many limbs, and the apple and peach are susceptible to similar influences. There are trees which have been grafted so that their blossoms present a bewildering variety of colors and shapes, and later of fruits. Placed near the front of a yard they serve as novelties which attract the attention of all visitors. Fruit trees of the same family can be grafted one upon another, the peach and plum showing their family relationship by working easily together upon the same graft. The cherry belongs to the same family, and can also at times be grafted upon the plum. But the stone fruits will not cross with the seed fruit, such as pears or apples. All citrus fruits will cross with each other, and a wild orange tree can be made to yield simultaneously a crop of lemons, oranges, limes, and grape fruit. The effect of such a combination of fruits is strikingly novel and effective.

The graft is easily worked, and the amateur will find great pleasure in manipulating it in the orchard or front yard. To accomplish results it is necessary to understand the art so well that with a little experience any graft can be made to grow. The graft is any young branch of a tree which is thrifty and full of sap, and it is cut off close down to the main trunk or branch on which it is found growing. It should contain a number of good, healthy-looking buds on it, and it should be cut clean off with a sharp knife. A ragged cut makes a poor graft. The bark should not be punctured or injured by bruises. The end of a graft, or scion, as it is sometimes called, should be cut to a sharp point like a wedge. This is to fit it in the tree or stock which is prepared to receive it.

For stock any sturdy growing tree, preferably young, but full of sap and strength, must be chosen. Cut off a limb about the size of the scion or graft, split the end so that the wedge end of the scion will fit snugly in it. The two should be fitted together so that the bark of each shall come close together. Then tie the split fork together with a strip of stout cloth, covering the wound first with grafting wax, and then binding the whole together with cloth. Splints should be placed lengthwise of the grafted limbs to keep the wind from blowing them apart. The work of grafting has thus been completed, and all that is required to make the two join together is time and plenty of sap. The work should be done in the spring or summer of the year, when the sap is in the trees, and the two edges will thus be completely joined together and the barks made one.

For ornamental effects it is possible to do considerably with the graft. A thrifty apple tree that produces Baldwins can be grafted so that it will yield in the fall half a dozen different kinds of apples—red, green, yellow, and blush varieties. Let the grafts be made on the limbs so that a beautiful blending of the different colored fruits can be obtained. If considered best the centre of the tree can be grafted with green apples; then a row of yellow fruit can be clustered around it, and an edge of bright red apples grafted outside.

Plum trees will yield one of the prettiest effects. The tree may be of some common native stock, producing each year a few hard green plums that never ripen. Graft on this tree fine varieties of greengages and the Japanese yellow and red plums. If carefully worked on the stock the effect is richer than a bouquet of flowers. The green, red, and yellow fruit blend in a most striking manner with the leaves. When the fruit is ripe there will be a rich variety that will tempt one to go from one branch to another to taste them. The Japanese, who have brought plum culture to the highest standard, graft their trees in this way, and their plum trees are really looked upon more as handsome landscape ornaments than as producers of profitable fruit. When one sees a plum tree in Japan laden with bright red and yellow fruit, he can accept it as a fact that it is placed there as an ornament. If the plums are to be eaten, the Japanese eat them when they are green, and not after they have matured. To them, a soft plum is a spoiled plum—too old to eat or to preserve.

Cherry trees offer the same opportunity for making horticultural effects through grafting. The red, white, and black cherries growing on one tree make a sight sufficient to cause the mouth of any observer to water. There may be half a dozen varieties of cherries grafted on one tree. The top branches may produce the rich black mazzards, a circle of branches a little lower down may yield the white varieties, and below these come the sour white cherries with pink cheeks.

TURKESTAN LUCERNE OR ALFALFA.

EXPERIMENTS AT BURNIMA, NEW SOUTH WALES.

(Continued.)

Sowing the Seed.—North of the Ohio River alfalfa should be sown in the spring; further south it may be sown either in fall or spring, though fall sowing is more likely to prove successful. Young alfalfa is unable to compete with weeds. If alfalfa is sown in the early fall, at a time when weeds do not usually germinate, its start in the spring enables it to overcome the weeds. For production of hay, alfalfa may be sown either broadcast or drilled. If sown broadcast, 20 lb. are used to the acre. In drills 6 or 7 in. apart, 15 lb. will be sufficient. When sown for seed production, as in the case of the seed distributed with this circular, it should be in drills 18 in. apart and cultivated sufficiently to keep down weeds and maintain an earth mulch 2 or 3 in. deep, especially during the first half of the growing season. This seed should not be sown with any nurse-crop, and the seed should not be drilled deeper than an inch or an inch and a half. On moist soils much less than this is better. Planted in the above manner, 20 lb. of seed will sow two acres.

Treatment the First Season.—Drills should be cultivated frequently enough to keep down weeds until the alfalfa has a good start, and it is better for the young alfalfa to mow it frequently, setting the cutter bar rather high, the idea being to cut back the young plants, so that they will branch freely. Frequent cutting also discourages weeds.

Saving Seed.—In sections where alfalfa makes two or three cuttings a year, and it does this in nearly all parts of this country where it is now grown, the second crop is usually the one saved for seed. It should be allowed to stand until the seed pods show by their dark color that they are ripe. It should then be cut and run through a clover huller, or the seed may be threshed out with a flail.—"Pastoralists' Review."

CULTIVATION OF VINEYARDS.

By Mr. H. Springbelt.

Ploughing should be commenced not later than July; if earlier it will give the rain a better chance of penetrating to the subsoil. Striking out should be done with a single-furrow plough drawn by a good steady horse, and should not be left to an inexperienced ploughman. A slow horse is preferable to a fast one, as the ploughman has more time to work round the vines. In striking out use leather traces and a short swing, say, 18 in. long; long swings are more likely to knock off the spurs and injure the rods. Take off the large wheel and standard, turn the headpiece so that the longest part is on the left side of the plough; if the plough draws too near the vines alter the draught a notch or two towards the right; if drawing from the vines change to the left. The ploughman can also adjust the course of the plough by pressure to the right or left as required. Two inches is deep enough to strike out along the vines; a light plough with long handles is best for this work, as it is easier to work in and out as it passes the vines. He had only used the old Yoh ploughs for striking out, and these, he thought, could be improved by having movable handles and extension headpiece. After striking out two more rounds with the single-furrow plough, then use the double-furrow. Strike out at every other row and finish at the row between. Care should be taken to strike out the following year in the row where you finish this year. If the crowns of the vines are not spread very much and are not too high the double-furrow plough can take out all but one furrow, which can be taken by the finishing plough. A plough that is good for striking out is also good for finishing. To set your plough for finishing take off the little wheel and the standard; then lift the big wheel, which will let your plough lean to the off-side. Set your plough to take as wide a furrow as possible, and then should you come to a wide place to take off you will be able to do so without going an extra round. It is far better to have a good wide furrow left for finishing, especially on sideling ground, as you have more for the plough to grip to. If your land is stony, take off the coulter. The plough will go into the hard patches better, and not slide away from the work so much. If the vines are medium size, say about 15 in. across the crown, the strip left along the row, after finishing, should be from about 6 in. to not more than a foot in width. Some people advocate ploughing vineyards twice, but he did not hold with it, as you can cultivate your land four or five times in the time it would take to plough it once, and get the land in better trim. The depth to plough should be according to the nature of the soil. Where the clay is close to the surface do not turn the clay on top, for it makes the land bad to work afterwards. The best thing to do where you want to break up the clay is to turn over the loam with one plough, and follow in the furrow with another plough with the mouldboard off. With a good deep loam that has been ploughed the same depth for several years you may find your plough is riding on a hard pan, which, unless the ground is fairly wet, you will have a job to break through. This pan should be broken through, and the winter rains will penetrate into the subsoil quicker and deeper, and prevent the winter rains from running away, carrying with it a lot of your top soil, and leaving plenty of small creeks. The more water that one can get into the land during the winter months the better. He did not believe in harrowing, for the reason that the land is left too level. The first rains will settle it down, and any rains that fall later will run off. If a cultivator is used, the surface is left rougher and looser, and a heavy rain will go into the land. He noticed when we got that heavy rain in December that very little water had run in the vineyards they were working; the loose, fairly rough surface of the land prevented the water running away. They used nothing but a Planet Jr., No. 7, and the No. 40 Universal cultivator, finishing all the ploughing first, and then starting the cultivators crossing the ploughing, and cutting out the middles left by the plough when finishing. After every useful rain during the dry months the cultivator should be put to work to move the surface, which acts like a mulch and prevents evaporation.

A Musical Education for Half=a=crown.

The above heading will, of course, appear to most people as the height of absurdity; yet the absurdity is more apparent than real. It goes without saying that a finished musical education in the regular course cannot be had for half-a-crown, or even with several hundred additional half-crowns; but can it be truthfully said that the person with a sufficient knowledge of music to play accompaniments on the piano or organ, to all the popular songs of the day, has no musical education? Assuredly not. A musical education, sufficient to enable one to play accompaniments to the home frequently, gets and gives more pleasure from the modest accomplishment than does many on whose education large sums have been expended.

To the more modest musical education the above heading applies. Such an education "The Australian Gardener" is now offering its music-loving readers for half-a-crown, believing that it is the greatest benefit we can give our subscribers.

This ready-made musical education consists of Pratt's Chart of Chords for the piano and organ, which is the nearest approach to the ready-made knowledge of music yet attained by science.

It is a short cut to harmony, and is to music what the multiplication table is to arithmetic, a quick method of learning to play the piano or organ without a teacher.

With this chart any one can, with but a small amount of practice, become an expert pianist. It is a complete self instructor, enabling any one to play the piano or organ at sight, and to play, without difficulty, brilliant accompaniments to any song ever written. It is valuable to the advanced musician as well as the beginner, embracing nearly every major and minor chord used in music; and is endorsed by teachers and musicians everywhere.

This chart is the practical result of years of study by Charles E. Pratt, the noted American composer and musician, whose compositions have world-wide popularity, and a larger sale than those of any other American or European composer.

Believing that the educational value of this Chart cannot be over-estimated, "The Australian Gardener" has arranged with the publishers to supply Pratt's Chart of Chords (published at 5s.) to its readers at the reduced price of 2s. 6d. each, with 2d. added for postage, and in addition to the Chart of Chords the publishers have kindly agreed to send without extra charge a copy of the Coronation Musical Folio, containing 48 pages of sheet music, and instrumental by popular composers.

Every home that has a piano or organ, especially where there are children, should have Pratt's Chart of Chords.

This offer is made for a short time only, and "The Australian Gardener" readers should avail themselves of it without delay.

Address—"THE AUSTRALIAN GARDENER," Adelaide.

The Australian Gardener

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Answers to Correspondents

Bulbs for Successional Flowering.—What different sorts of bulbs must be used to give a show of flowers for as many months of the year as possible, the bulbs to be suitable for a suburban garden?—The earliest of all bulbous or tuberous rooted plants to flower in the open garden are the Winter Aconites, though some of the early-flowering Irises, such as I. alata, I stylosa, etc., often bloom quite as early. Then come the Snowdrops, Scillas, Crocuses, Chionodoxas, Tulips—the dwarf, early-flowering kinds coming first, followed by the tall, later kinds, then the "florists'," "Cottage," and "Darwin" species and varieties; Narcissus in great variety (these should have before the last really); then Ixias, Sparaxis, and others, Ranunculuses, Anemones, etc., during the early summer, followed by Lilies, early and late-flowering Gladioli.

Storing Dahlias.—When the frost has blackened the leaves and the ground is fairly dry, lift the Dahlias, and when the soil falls away from the tubers they may then be stored in a clean state. Dahlias should not be kept too dry during the winter, a cellar where frost cannot reach them being an excellent place Cover the tubers with soil, this just keeping them moist, and, at the same time, warding off frost. Here they may remain until you want to start them. You may divide the old tubers after they have started into growth in the spring.

Evergreen Plants for Tubs.—Nothing better than Golden Holly, Golden Euonymus, Juniperus sinensis aurea, Golden or Green Yew, or the Green Bay tree. A good flowering plant is the free-flowering Hydrangea Hortensia or one of its varieties ,or the equally good Hydrangea panicnlata grandiflora, with its huge, pyramidal heads of flowers. Another excellent tub plant is the blue African Lily (Agapanthus umbellatus), which, however, requires to be kept free from frost. Any porch or entrance-hall is sufficient for this, and in late summer there is no finer flowering plant. A good example will give a dozen or two dozen heads of its flowers, and this or the Hydrangea will afford much pleasure and repay generous treatment into the bargain.

Potting a Plant—When a plant requires repotting into a larger pot the old soil should not be shaken away from the roots but merely the old drainage material taken away, and a very little of the old soil removed from the top of ball of roots. The plant is held in position in the centre of the pot by the left hand, whilst the soil is placed around its roots by the right hand. The pot should of course be drained first, and a little rough material be placed over the drainage before the plant is put into the pot. The soil should, generally speaking, be pressed down rather firmly around the roots, and sufficient space—say an inch—should be left below the rim of the pot to hold water when required.

The Flower Garden

OPERATIONS FOR SEPTEMBER.

September is the first month of our beautiful spring. It is the time when the patient gardener begins to see the results of his planning and plotting and planting. Failures of course there must be, but they only make the enjoyment of success more keen. Mr. Hawthorn draws some beautiful pictures for the Gardener, and if our readers can approach some of the suggestions they will be well repaid.

The sight cannot take in the whole of a border at once, unless the latter is so short as to be insignificant, or is viewed from such a distance that only the colors, not the shapes of the flowers, are discernible. For this reason, the best planned border will be one in which one stretch of harmoniously set plants succeeds another. Each will form, as it were, a complete picture, to be passed ere the next is reached: but it is necessary, of course, for the colorings of the different stretches to merge pleasantly into one another. This mingling will always be satisfactory if done by white or pale lemon flowering plants, or plenty of green and white, green and yellow, yellow, or coppery foliaged subjects.

One charming border stretch can be made by white Foxgloves and Chrysanthemum uliginosum against a golden shrub or two in the background, a clump of Lilium candidum, a group or more of deep and pale blue Delphiniums, then one of deep indigo purple Delphiniums, a mass of dwarf and taller gold and bronze esrly Chrysanthemums, and some dwarf deep lilac Michaelmas Daisies; plenty of blue Hepaticas, double and single Daffodils, Irises of various kinds, Campanula Carpathica alba, Veronica spicata, Trandeacantia Virginica, and Gentianella, Primroses and Bluebells, around generously large masses of Aquilegias, white, yellow, and blue and white. Some plants of Centaurea montana, Helianthus giganteus, Golden Rod, and yellow and also deep blue Lupins will further improve the collection.

White flowers may separate these from the next stretch of border, in which quantities of Enotheras may be the chief feature. It is as well, in a long border, to allow each of the principal plants a chance to show all different varieties, and the beauty they themselves can yield when massed. If the Enotheras are well represented visitors to the garden will recognise admiringly what are the merits of Evening Primroses, so many of which are lovely also by daylight. A few shrubs of Vaccinium Pennsylvanicum will make a perfect background here; they will be espescially welcome when red tinted in autumn, and their bluish berries will please also. Another suitable touch of warm autumn color can be provided by an Ampelopsis grown up a wall, pillar, or dead tree. A Clematis Jackmanii should be similarly grown, so that its rich purple blossoms may hang upon the pale yellow Enotheras.

Columbines, Anemone Pulsatilla, A. Hepatica lilacina, Campanula glomerata, Eupatorium purpureum, Erigeron Alpinum grandiflorum, E. Stenactis speciosus. E. macranthus, purple Delphiniums, Dahlias of mauve and purple shades, also Hollyhocks, German Irises, Aubrietias, Geraniums Pratense and Ibericum, Fritillarias, and Pansies are a few of the sorts suitable for giving mauve and violet shades in the same stretch.

The yellow flowering herbaceous plants are so numerous that a choice could be made without any difficulty. but the effect will be prettier if only pale yellow ones are allowed just there—none that will "kill" the Enotheras, Primroses, Oxlips, Alyssum saxatile. Lysimachia vulgaris, Hypericums, Daffodils, Lilium monadelphum, Centaurea macrocephala, lemon Sunflowers, Hollyhocks, and Dahlias, Spanish Iris, Eremurus aurantiacus, Doronicum plantegineum excelsum, Carnation Germania, lemon Iceland Poppies, Darwin Tulips, and Wallflowers, Chrysanthemums of early flowering sorts, such as Lemon Queen, Canari, and Precocite, yellow bedding Pansies and Viola Ardwell Gem will be found excellent, while a young Laburnum tree or two will improve the background.

The next stretch of the border, a connecting one, can be made up of white Narcissi, Chrysanthemum maximum for the chief feature, which will keep on blooming from early summer until winter in all probability, white Brompton Stocks and Chrysanthemums Queen of the Earlies and Madame Desgranges, with a few small and large flowering white Michaelmas Daisies, and plenty of hardy ferns and other vivid green foliage plants.—M. Hawthorne.

BEAUTIFUL CAPE BULBS.

Watsonias.

Up to the present time Watsonias have not been so generally grown as their peculiar stateliness and beauty warrant, therefore if any readers wish to grow a class of bulbs that will at once give them pleasure and place them above the rank and file of growers they should certainly grow Watsonias.

These natives of Southern Africa reach a height of from 2 to 3 feet when in bloom, their flower stems being usually well branched, and thus able to produce the greatest possible effect from a minimum of rootstock. Unfortunately, however, their culture cannot be recommended as hardy subjects, notwithstanding the fact that some people have been fairly successful in treating them as such.

A good plan to adopt is planting the bulbs in a pit or frame having a sunny aspect, and providing them with a mixture of sandy loam and peat in proportion of 2 parts of the former to 1 of the latter. Here they can be given all the shelter they need and may also be fully exposed. Some protection in the way of mats or dry bracken will be advisable during severe frosts, but as at that time the bulbs will be at rest and the soil dry it will not really be necessary to provide artificial heat.

Grown in pots, Watsonias are great favorites with those who have taken up their culture with any degree of earnestness, and this method is specially commended. Let us commence with the dry bulbs. Few are to be given away, so a little of the coin of the realm must be expended. They are procurable during the winter and early spring, and are best potted when received. According to the size of the bulbs put three or five of them in a 6-inch pot in sandy loam and leaf soil, to which may be added a little well-decayed and dry manure, but the latter must not be present in larger proportion than 1 part in 4 parts of the whole compost. A shelf in a cool greenhouse will suit admirably as a home for the plants right on to the time when the spikes begin to extend, when it may seem desirable to put the most forward in a slightly warmer place with the object of hastening the flowering.

Until growth commences little water is needed, indeed, the less water given the better, and to that end the compost ought to be nicely moist at potting time, though by no means wet or sticky. Give water freely when growth is vigorous, as then the roots are in a condition to make use of it. Further, when the flower stems are steadily lengthening weak liquid manure given at every second or third watering will add materially to the number, size, and substance of the flowers.

After the blooms have faded the leaves will soon begin to turn yellow, and this must be taken as a sign that the functions of the plants are ceasing for the season, and water must be given in regularly decreasing quantities, eventually withdrawing it altogether for the winter. Now a word as to propagation. This is a most interesting part of Watsonia culture, and may take the form of simple removal of offsets while the bulbs are at rest, or may be accomplished by seed sowing. If the latter method is adopted it will be necessary to use shallow pans of light, rich soil, covering the seeds an eighth of an inch, and place them in a temperature of from 55° to 65°. During their babyhood the seedlings need a little more care than does the older stock.

TULIPS.

In these sober days, when the tulip, the queen of spring flowers, is to be bought and sold as cheaply as 3/ per 100, it may seem hard to realise (says "Amateur Gardening") that time was when a single bulb would fetch as much as £250 to £500. Yet it is too true that in the days of old, stolid and phlegmatic Dutchmen absolutely lost their heads and their wealth in bulb buying and collecting. It was in the year 1634 when our brother Dutchmen became mad on tulips. This craze took hold of all classes, rich and poor, learned and ignorant; though, of course, the rich were able to collect the largest and best selections, only, in due time, to find themselves ruined, when the bulbs once more fell to their normal onion price value. As everybody was crazy in the eagerness to purchase tulips the price rose enormously. Diamonds and precious stones were regarded as trash in comparison with a few good bulbs. Those were the halcyon days of growers and bulb merchants. Many made their fortunes, though some came a cropper with the buyers in the inevitable crash which was not long in ensuing. As much as £10,000 is accredited to have been given for a collection of 40 roots. The craze dropped as quickly as it rose, and when the fictitious prices began to drop Holland was plunged into a state of financial difficulty even worse than that which prevailed in England at the bursting of the South Sea Bubble, or of that of France during the Revolution.

THE WEST SUBURBAN H. AND F. SOCIETY.

A well-attended meeting of the committee of the above Society was held in the Institute on Wednesday, August 24. A large amount of business was transacted in connection with the forthcoming Show, to be held in the Thebarton Town Hall on October 18th. The secretary reported the receipt of several donations; also a letter from Lady Way accepting the invitation to open the exhibition. The report of the sub-committee revising the prize list was adopted with a few open classes added. This was ordered to be printed without delay. The committee is a strong one and are working hard to make the Show a success. The Town Hall has been engaged, and all arrangements are well in hand.

FERNS.

Ferns present an immensely long lineage, longer by far than the oldest of the flowering plants. They form an important portion of the present vegetation of the globe, numbering, at a low compntation, 3,000 species, belonging to about 60 genera. Attaining their fullest development in the hot, damp, carboniferous forests, they have ever since maintained their preference for heat and moisture. The vast bulk of the 3,000 existing species, says "Knowledge," cling to the tropics, and among the 47 species which are found in Great Britain, hardly one but seeks a damp and shady situation. Ferns are essentially hygrophiles—moisture lovers—and the student of botanical geography will note how they increase in number as one passes from dry to wet regions. In the much divided nature of their fronds, ferns also show the character of a damp-loving and shade-seeking ancestry, where compactness of growth to prevent excessive transpiration was unnecessary, and a spreading out to catch the maximum of light an advantage.

PLANT GROWTH.

Plants are not favorably circumstanced for growth when thirsty, as water comprises three-fourths to seven-eights of their total weight. Through water plants get all their nourishment, and when the supply of water is limited the growth is slow. After a good rain following a period of dry weather, it has been demonstrated by Professor Roberts that a crop of potatoes will make a gain of 7 bushels of tubers per acre each day, without the addition of any plant food, only water. The finer the soil is divided, up to a certain point, the more water it will hold. One acre of soil 1 ft. deep weighs about 1,800 tons, and contains about 20 per cent. of water, except in a period of drought.

Lime tends to flocculate or bind the smaller particles of soil into larger ones, and makes it of great porosity. In clay soils lime lightens it, while in sandy soils the lime tends to bind the coarser particles of sand together, and allows the finer particles of silt to settle between them, and make the soil firmer and heavier.

Seeds which are small require shallow covering with soil, hence they demand a seed-bed made extremely fine, and which may be compacted with the roller, or, if a small area, the back of a shovel may be used to prevent too free circulation of air, and to bring moisture to the surface; in the case of large seeds, which require deep covering with soil, the surface need be only fine enough to induce capillarity to bring water near the surface. Plants which throw out roots near the surface of the soil should receive shallow surface tillage, while those which root deeply may have deep tillage. The aim should be to prevent the water from rising above the earth in which the roots are feeding.

Surface tillage may be made not only to conserve moisture, but to set free plant food; if the plants are deep-rooted, they may secure only a small part of the food liberated by tillage. This emphasises the need of deep cultivation of the land for all tap-rooted plants—carrots and parsnips, for example—while for shallow-rooted ones deep tillage is not so imperative. Too much stress cannot be laid on the necessity of superior surface tillage for the purpose of providing a mulch of fine earth to conserve moisture, promote filtration, and the easy passage of moisture upwards. Whenever heavy rains have produced a crust on the surface of the soil it should be broken up by tillage as soon as the ground is in a suitable condition, that the earth-mulch may be restored, and evaporation arrested.

Tons of plant food frequently remain unused in a garden soil, and utterly useless, for lack of moisture, to transport the waiting nourishment into the living plants.

Harpenden. J. J. Willis.

THE WILD CHINA ASTER.

CALLISTEPHUS HORTENSIS.

Until a few years ago the type from which the numerous annuals known in gardens as China Asters were raised was known from dried specimens only, for although it had been introduced it had been lost. Now, however, it is becoming fairly common, and is recognised as a useful annual, and for some purposes it is quite as good as, if not better than, the popular garden varieties. It is found both in China and Siberia, and under cultivation attains to a height of nearly 2 feet. It branches freely from near the base, and a dozen or more flower heads are borne by each plant. The inflorescences are from 3 to 4 inches across, the ray florets being large and deep mauve in color, the disc florets being yellow. As the stalks to the flower heads are from 12 to 15 inches long, it makes a useful subject for cutting. Seeds may either be sown indoors or out, and the flowering period is late summer and early autumn. Some idea may be gathered of its tendency to sport by the fact of twelve distinct shades of color being produced in a patch of several hundred plants, the seeds for which had been gathered from true colored specimens which showed not the slightest break.—D. L. More.

ROSES.

THE CULTURE OF ROSES.

The following paper on "The Culture of Roses" was read by Mr. H. Brunning at a meeting of the National Rose Society of Victoria:—Among Rose growers it is a recognised fact that all Roses must be pruned, whether wanted for exhibition purposes or the ordinary decoration of the flower garden; if the object in view is to be the production of show blooms, then the pruning will take a more severe form than would be the case if ordinary cut flowers are all that is desired.

Everyone who has studied the growth of a Rose, I presume, knows that it is not a tree to grow outwards and upwards continuously; but from year to year forms fresh channels in the way of new and vigorous shoots, for the flow of the sap; that being so, the older growths become almost dormant and useless, hence the necessity for their removal. The object of pruning then should be to try and maintain an equal supply of sap to each shoot, at the same time moulding and preserving the shape of the plant. The golden rule, as applied to pruning, is that the stronger a plant or shoot the greater number of buds to be left; and conversely, the weaker a plant or variety, the fewer its buds for future growths, the object being to increase the sap flow to a limited number of buds, and so ensure more vigorous shoots and blooms. A weakly grower (for exhibition blooms) should not be allowed to carry more than two shoots, and double that number of buds, or even less, to ensure good flowers. My own experience is that July is quite early enough to commence pruning the majority of sorts; should it be done earlier in the season, and warm weather set in, as has been the case the last year or two, the buds break into growth some 2 or 3 in., and are immediately attacked by green fly, and the frosts following on, the young growths have to contend against the two evils, with the result that the greater number are stunted and receive a check which is detrimental to their future well doing.

Should the pruning take place as here advocated, say from the middle of July, I think these disadvantages are to a great extent obviated. Some experience is necessary in dealing with certain varieties to enable us to know which shoots to retain and which to remove; the object at all times being to secure a renewal of wood from year to year, and as all classes cannot successfully be treated alike, growers should carefully note the results which follow their treatment, and the experience thus gained will be available for their future guidance. Rose plants, particularly old ones, are very liable to be attacked by disease, their principal enemy being Apidiotus rosae, commonly called white scale, and to combat this, after they have received their winter overhaul, I would advocate a spraying of kerosine emulsion, best done on a dull day, made as follows:—Dissolve 3 oz. of lotus soap in one and a half gallons of boiling water, and when thoroughly dissolved add half a gallon of the best kerosine, and churn thoroughly with a force pump or syringe for at least ten minutes, pumping out of and into a bucket through a rose nozzle until completely emulsified. If the mixture is sufficiently hot it will thicken in from five to ten minutes, and will be when cold of the consistency of butter or soft-soap, and will adhere without oiliness to the surface of glass. For use, dilute with from 15 to 16 parts of rain water. The emulsion should not be diluted until immediately before it is used.

The other pests Roses are most troubled with are aphis, or green fly, and mildew, the former making its appearance in early spring, but if taken in time is easily removed by careful hosing, or, if more convenient, dust the plants occasionally with insectibane, allowing it to remain on for a few hours, after which it may be washed off with a garden syringe. Where Roses are largely grown this treatment would become rather expensive, and I should then advise falling back on the good old remedy of soft-soap and tobacco juice, made as follows, viz.:—Take half a pound of colonial tobacco and pull to pieces, tie same up in a piece of calico, and place in a saucepan with the soft soap and a little water; boil for twenty minutes, then add sufficient water to make in all eight gallons; apply to the affected plants with a spray pump, and after about an hour syringe the plant with clean water. Two or three applications during spring will suffice to keep Roses clean. Both aphis and Aspidotus rosae attack plants more readily which are old and worn out, or impoverished through lack of nourishment, than when in robust health.

Mildew can be easily recognised by the frosty appearance it has on the foliage. It is a fungus, and if not taken in time will spread very rapidly, and cause the plants to lose their leaves. It is most effectively checked by dusting flour of sulphur freely over the affected foliage in the early morning while the dew is still upon it. Care should be taken to apply the sulphur to the under as well as the upper surface of the leaves. It is imperative, when procuring plants, to see that same are healthy, not necessarily large, as from a sickly or stunted bush we can never hope to succeed in getting good flowers, no matter how cultivated or pruned; and I maintain that it is simply a waste of time and money to bother with them. My advice to any novice who is about to try his hand at pruning is to start in a systematic manner on something like the following lines:—First—Cut out all dead wood. Secondly—Remove all weak and spindly growths, together with all worn-out and exhausted wood. Thirdly—Then select the shoots you intend to retain, and remove all others, always having consideration for shape of plant. Fourthly—For standards and half-standards shorten the selected shoots to two or three eyes, and for plants on their own roots, or ordinary budded ones, from three to five eyes, always cutting to an eye, pointing in the direction you wish it to grow. For instance, with standards and half-standards, or any budded on the Adelaide stock, you, as a rule, require the shoot to grow inward, to shape and balance the plant, whilst those on their own roots, or budded on other stocks, the reverse takes place. Should you consider, when the buds break, that they are too numerous and crowded, their number may be easily reduced by rubbing off those which, in your opinion, are likely to interfere with the development of the others. This should be done when the young shoots are about half an inch long, as if left when unnecessary they are only robbing the plant of its sap. Fifthly—Thin out the flower buds as soon as they make their appearance, selecting two or three only on each shoot, and as they develop the weaker ones may be removed.

Liquid manure may now be given with advantage, and I would suggest the following as being both simple and effective:—Fill a small bag with about 28 lb. of fresh cowdung, adding a little soot (about a 4-in. potful, placing same in a tub containing 20 gallons of water, leaving it to stand three or four days before using. Dilute one pint of this mixture with two gallons of water when using. Renew this preparation every two or three weeks. With regard to manures, for a loamy or heavy soil, dig in a liberal supply of well-rotted horse manure and a light sprinkling of bonedust, added to which a little soot will be found beneficial. On the other hand, should your ground be of a sandy nature, the addition of some clay will be found useful, and substitute cow for the horse manure, not forgetting the bonedust and soot—the two latter to be used sparingly. Of course I am now dealing with established plants. There seems to be an idea amongst certain growers that show blooms cannot be produced on standards, and I here take this opportunity of saying that I entirely disagree with such a notion, as, if I remember rightly, when the Rev. W. Fellows was a constant and successful exhibitor at all our leading shows, the majority of the flowers to be found in his winning stands were grown on standard trees. If I may be allowed to mention a matter regarding the showing of H.P.'s and Teas on the one stand, I think that, considering the advantage an H.P., (when well grown, which cannot be done unless you have suitable soil) has over the Teas in respect to color, something should be done to keep the two sections entirely distinct, as one can successfully compete with the Teas against their older rivals.

RIVAL ROSES AT THE TEMPLE.

(From "The Gardener.")

GREAT SUMMER SHOW OF THE NATIONAL ROSE SOCIETY, LONDON.

The superb display of Roses at the Temple Gardens on Wednesday, July 6th, proved conclusively two things: 1, that the Roses of 1904 are equal in size, form, and color to any of their predecessors; and, 2, that the queen of flowers is still able to draw a crowd of devotees in face of strong counter attractions. The weather was glorious, and thanks to every available opportunity being taken of airing the tents the heat was never given a chance of becoming oppressive.

ARCHWAYS OF ROSES.

One of the prettiest features of the show was the decorated arches. These were 7 feet high and 4 feet wide, and were arranged in a row just inside the entrance to the first tent. Two varieties of Roses were allowed for the decoration of each arch, the stems to be in pots or in water, and some very fine results were obtained. Messrs. Paul & Son gained the premier award with a telling arrangement of Wallflower and Leuchtstern; Mr. G. Prince was second, and Mr. C. Turner third.

ROSES AS TABLE DECORATIONS.

Some exceedingly pretty tables of Roses were arranged by ladies in Class 64. Occupying the centre of a large tent, and being many in number, a fine effect was produced. Miss J. B. Langton was adjudged the winner in what must have been a difficult competition to decide; Mrs. O. G. Orpen was second, and Miss D. M. Oliver third. The prize table was decorated with Rosa macrantha, asparagus fronds, and pink chiffon; Miss Oliver's table was an example of simplicity and elegance seldom surpassed, Rosa Leuchtstern and asparagus fronds being its decorations.

VASES, BOWLS, AND BASKETS.

The value of the Rose for house adornment was well shown in the classes for vases, bowls, and baskets. Mrs. H. E. Molyneux had the premier vase, a gigantic trumpet-shaped affair, filled with good blooms of Killarney; the first prize bowl came from Mrs. O. G. Orpen; and the leading basket from Mrs. J. Lewis. This was an informal, boat-like structure, made of birch twigs, with a long birch handle, and elegantly filled with various brightly colored Roses.

NURSERY CHAMPIONS.

In the purely competitive as apart from the decorative section, greatest interest centred in the great trophy class for 72 distinct varieties staged on the orthodox stands. Here Messrs. R. Harkness and Co. proved once more the superiority of the Hitchin Roses by carrying off the premier award from Messrs. B. R. Cant and Sons and Frank Cant and Co. So good were all the blooms in this stand that their names are worthy of transmission to posterity, but exigencies of space permit of mention only of the following, which were of super excellence:—Mrs. E. Mawley, Killarney, Dupuy Jamain, Souvenir d'Elise Vardon, Maman Cochet, Maréchal Niel, Ulster, Alice Lindsell, Dr. Andry, Her Majesty, Marquise Litta, and Madame Delville.

Messrs. A. Dickson and Sons were first for forty distinct varieties, three blooms of each; and Messrs. J. Burrell and Co. for forty-eight blooms, distinct varieties; Mr. G. Prince led for twenty-four blooms of Teas or Noisettes, and also for fourteen distinct varieties, three blooms of each, in vases; and Mr. G. Prince again scored in the class for nine distinct varieties, seven blooms of each, in vases. Messrs. Dickson, Turner, Burch, Jefferies, Mattock, and Cooling were also winners in the nurserymen's classes.

AMATEUR CHAMPIONS.

In the great amateurs' class for thirty-six distinct varieties, which carries with it the champion trophy, Mr. E. B. Lindsell continued his series of victories, staging magnificent flowers. Mr. Conway Jones filled second place with a well grown and shown collection. The Christy cup was well won by Mr. E. M. Eversfield, but Mr. Lindsell again came to the front in the classes for twenty-four blooms, twelve distinct, three blooms of each, and for nine blooms of any Rose in a vase; Alice Lindsell being the chosen flower. Messrs. A. Hill Gray, F. Dennison, O. G. Orpen, A. Slaughter, A. Tate, and E. B. Smith were other successful amateurs.

SOME CHAMPION ROSES.

Mildred Grant was easily the champion Rose of the show, receiving a medal for the best H.T. in the professional classes, where it was shown among F. Cant's seventy-two, and also in the amateur section, where E. M. Eversfield had a superb bloom in his stand which won the Christy cup. White Maman Cochet secured a medal for Mr. G.

Prince as the best Tea or Noisette in the nurserymen's classes, and also for the Rev. F. R. Burnside in the amateur's section. Frau Karl Druschki, in splendid form, gained Mr. E. B. Lindsell a medal among the amateurs; and Ulster, a grand H.P., did likewise for Messrs. A. Dickson and Sons among the nurserymen. Of new Roses, Dean Hole, from Messrs. Dickson and Sons, received a gold medal; and an attractive new climbing Rose called Mrs. O. G. Orpen, from Mr. O. G. Orpen, and Lady Betty and Irish Harmony from Messrs. Dickson received cards of commendation.

Mildred Grant.---Champion at Temple Show, London.

NEW ROSES.

The most promising Roses for the approching season of bloom, because the most vigorous in their growth and development, are Florence Pemberton, Corinna, and Field Marshal.

Corinna is regarded by its veteran originator, Mr. Wm. Paul, as an advance on White Lady, which was itself an improvement on Lady Mary Fitzwilliam; while Field Marshal is a perfected version, somewhat larger, fuller, and darker in color, of the old French Cramoisie Superieure. Mildred Grant and Alice Lindsell, which have been much eulogised in the catalogues and have been very successful at Rose exhibitions, are varieties of moderate growth; but as they flower with facility will doubtless be very effective in the garden in situations where their blooms can be artistically displayed.

Souvenir de Pierre Notting, one of whose parents was Maréchal Niel is a strikingly beautiful and impressive variety, especially when half-blown. Like the white Maman Cochet it is a grand acquisition.

ROSE MRS. ANTHONY WATERER.

Among Rhododendron growers it is a well known fact that any variety named after a Waterer can be depended on to be a first rater, and the same can also be said of this Rose. Sent out about ten years ago, it was one of the forerunners of the race of Rosa rugosa hybrids now in general cultivation, and which are hardier than the ordinary run of garden Roses. Mrs. Anthony Waterer was raised by crossing R. rugosa with General Jacqueminot, and a short time ago the original plant was to be seen in Mr. A. Waterer's nursery. In appearance it is midway between the Japanese species, and the H.P., the branches being very spiny, and the leaves and flowers large. When well established, branches 5 to 6 feet long are formed, and these produce the lovely, double, deep red blooms from almost every bud. For growing in a semi-wild state it is excellent, for once placed in deep, rich, loamy soil it causes no more trouble than that experienced by giving an occasional thinning.—D. L. More

ROSE SIR JOSEPH PAXTON.

I think I must have got my plant forty years ago, and for a long time I did not do it justice, but seven or eight years since I took it in hand, split up the clump into which it had grown, and made four or five plants of it. It has repaid me liberally for cultivation. For six months it is never without blooms; sometimes a long, strong shoot of the previous year is laced with them. Old as it is, it is well worth notice for cutting for the house. Teas and their hybrids do not answer so well with me as Hybrid Perpetuals. Varieties of the former seem to have been raised and sent out of late years for "button-hole" purposes, regardless of perfume, so that Shakespeare could not now use the Rose as the embodiment of sweetness. Mrs. W. J. Grant is very useful with its umbel-like inflorescence, each bud with a sufficiently long stalk. But for fragrance as well as for late blooming, commend me to the H.P.'s.

SILVER-LEAF DISEASE.

For many years the so-called silver leaf disease has been a source of vexation, trouble, and disappointment to gardeners in England, its presence being all the more annoying because no cause could be assigned for it, and, of course, no remedy could be applied. Plums and peaches are perhaps the trees most frequently affected, but other stone fruits are also attacked. Professor Percival, of Wye College, has been investigating the disease lately, and has discovered the cause in a fungus which attacks the root and underground portion of the trunk. Since no mycelium or fungus threads are found in the leaves the professor is of the opinion that some deleterious substance is formed in the roots either directly by the fungus or indirectly as a result of its attack, and that this substance is carried upwards through the stem and branches to the leaves. The professor will now have to determine what this substance is and, what is more important, discover a remedy.

BURBANK'S METHODS OF FERTILIZATION.

The supply of pollen is generally secured by gathering a quantity of the anthers of the desired pollen parent, usually the day before the pollen is to be used, and drying them carefully. When in proper degree of dryness, the pollen is secured by gently shaking or sifting the mass of dry anthers over a watch crystal until the surface is dusted over with the pollen, the dust film appearing most clearly on the lower parts of the curved surface. Each genus, each species, and sometimes each variety, requires modifications which are suggested by experience. The largest quantity of blossoms of a single variety which Mr. Burbank has handed at one time is about a pint. He has found that properly dried pollen ordinarily retains its efficacy about one week; it might, perhaps, in many cases retain its power much longer.

The preparation of the blooms of the seed parent consists in removing about nine-tenths of the bloom buds when they begin to show the petal color, leaving, in trees which bloom freely, about one in ten of the natural blooms to be operated upon. This is for convenience of operating and to avoid the setting of too many seeds for the tree to properly perfect. Before the petals open, each of these buds is carefully cut into with a small sharp knife blade, in such a way that the petals and a part of the sepals and all the attached anthers are removed as the knife makes its circuit, leaving the pistils exposed but uninjured by the operation.

The removal of the corolla balks the bees and other honey-seeking insects, either by the loss of color or by the absence of an alighting place, or both. The buzzing Archimedes finds no place for his lever and goes his way, the honey unsipped and the pistil free from contact with pollen-dusted body. Mr. Burbank finds it, in most cases, unnecessary to cover the emasculated bloom to avoid instruction of undesirable pollen by insect agency.

He chooses for pollination the time when the first hum of the bees is heard in the trees. He finds all conditions at that time most favorable, and believes the pistil is then in its most receptive state. The instrument of pollination is the finger tip. Applied to the dusted surface of the plate, either by a mere touch or a slight rubbing, enough pollen adheres. The finger tip is then quickly touched to the pistils of the prepared blossom one after another. They welcome the pollen and the fructifying agency begins at once its journey to the ovule. No matter what comes now, on the wind or otherwise, the opportunity for outside pollen has passed. The touch of the finger has covered the stigma with the chosen elements and sealed it safe from further instructions.

In his choice of the unaided hand as the instrument of pollination, Mr. Burbank has not only vastly simplified and made more expeditious the act of pollination, but there is also involved a profound tribute to the superiority of the trained hand in directness and delicacy for what lies within its unaided scope. Recourse to instruments and appliances is often essential, but, in many lines of human effort, the direct contact of the finger tip works wonders impossible with intermediaries. It is an interesting reflection that when Nature's direct agencies, the bustling bees, are put to flight the human hand enters directly for man's specific purpose. Naturally, particular skill is acquired by long practice, and some of Mr. Burbank's most trusted employees have done much of this work for years.

The seed resulting from cross-pollinated bloom is, of course, gathered with great care; seedlings are grown, and the closest watch is kept upon their characters and habits from germination onwards. The little seedlings may disclose its combined parentage or give sign that it has drawn up something from the profound depths of the converging streams of its remote ancestry, long before it reaches blooming or fruiting stage. Tokens which would escape the ordinary observer become clear as milestones indicating the life courses of the new plant to the skilful propagator. The art of selection begins, then, early in the development of the crossbred plants. Incalculable numbers of them may be destroyed for their too evident adherence to the old types, and only one or, perhaps, thousands, be retained because they give promise of breaking away from such bondage. Whenever such selected seedlings are capable of budding or grafting they are thus introduced to the forcing influence of old plants of the same class and hurried to flower or fruit in this well-known way. A single old plant or tree may thus force its sap into the cells of hundreds of buds or grafts of new varieties, and can be convinced to be as surprised at the multitude of strange forms and colors appearing on its old branches as a mother hen would be at hatching a brood of blue jays.

The Orchard.

OPERATIONS FOR SEPTEMBER.

During the month of August the ground of orchards will have been properly cultivated. We have always recommended persistent cultivation and drainage of the soil. Slovenly work is of no use whatever. Do everything thoroughly. Continuous aerating of the soil by turning it up to receive the alternations of sunshine and rain to keep it sweet, and the addition of manure to keep it in good heart are the necessary requirements of water, care being taken to use the cultivator or plough in the direction that will carry off surplus water. We have repeatedly seen the cultivation of orchards left in such a fashion that the water cannot possibly get away. This is a mistake. A little common sense should obviate this.

Winter pruning will have been completed. The later kinds of trees may still be planted for a while as the season is later than usual.

The next business to engage attention is the preparation for spraying. The sun will soon be gathering strength, and as the trees put forth their vigor in bursting buds the worst pests are released from their winter hybernating quarters. To kill them off before they get a chance to spread and deposit eggs is the best prevention, and the sprayer must be got to work without much delay. We are great believers in Kedzie's Arsenite of Soda, and give the process of making it as published before, and as given in the "Journal of Agriculture":—The solution of Kedzie's arsenite of soda supplied is to be used at the rate of 1 pint in 40 gallons of lime water.

The following method of compounding the spray wash is recommended:—Take not less than 4 lb.—a little more is desirable on account of waste—of lumpy quicklime, quite fresh, and newly burnt, and slake it slowly by adding small quantities of water from time to time until the lime crumbles to powder and yields up its heat. Then thin down with clean water and strain out the sediment by passing the liquid through a bag or other close strainer. The pint of arsenite of soda should then be stirred into this strong milk of lime. After a short time the lime and arsenic mixture may be poured into the body of clean water which is required to make up the 40 gallons of spray wash.

Where it is desirable to combine Bordeaux mixture with this spray the arsenite of soda should be prepared in milk of lime as outlined above, and then mixed with the diluted Bordeaux instead of clean water to make up the required volume of spray wash, as follows:—Suspend 4 lb. of bluestone just beneath the surface of 10 gallon of water in a wooden tub or barrel overnight, and in the morning it will be in solution. Slake 4 lb. of fresh lime, thin and strain as described above, and then dilute it to 10 gallons with clean water. Into another lot of strong lime water, made by slaking and straining 4 lb. of fresh lime, pour 1 pint of the arsenite of soda. The 10 gallons of lime water and the 10 gallons of bluestone water are now mixed together, and the lime water containing the pint of arsenite is poured into this in turn. Enough clean water to make up the 40 gallons of spray is then added. This wash would then contain equal to 8 lb. of lime, 4 lb. of bluestone, 1 pint of arsenite, and 40 gallons of water. Freshly burnt lumpy quicklime is absolutely essential to avoid burning the foliage and fruits, and a little excess of fresh lime will do no harm, while a much larger quantity of stale lime will not act as a substitute for the quantities of fresh lime given herein. The arsenite of soda, as supplied in the tins, will destroy vegetation, and to change it into arsenite of lime, which will not injure the trees, fresh lime is essential.

The first spraying should be given as soon as the young fruits are formed, and the second about nine days later. In these two operations the spray should be driven into the calyx cup of each fruit. The third spraying should be applied 14 days later than the second. The fourth should follow 21 days later, and the fifth at a similar interval after the fourth. The object of the operator should be to keep the fruits coated all over with the spray.

TREE PLANTING.

By Mr. W. Rogers.

As the result of bad planting hundreds of trees that are put in the ground never grow; hundreds more drag out a miserable existence for a short time and then die. The few hints I now offer will be a humble attempt to remedy this, because it is very unsatisfactory for any one, after going to the trouble and expense of procuring and planting trees, to have them die.

Hard and fast rules for planting cannot be set down any more than for any other branch of gardening, and the best rules and experience must yield in some measure to circumstances, soil, and situation. However, the few hints I shall offer may lead to a discussion that may in some degree remedy this evil.

Preparing the Soil.

As much depends on this, I would advise wide each way, the soil thrown out so as that some attention be given to the preparation of the soil. This may be [illegible] any time in the summer, but the earl[illegible] better. A hole should be dug 4 or [illegible] to be well pulverised by the sun, and, if [illegible] soil is very stiff, it might be turned over or pulled about with the cultivator once or twice, so that the sun may get to every part of it. This may seem a great deal of labor, but I think it will be repaid by the result that will follow.

Time for Planting.

The best time for planting orange trees and evergreen shrubs is, I think, the month of May, or the latter part of April if there has been a sufficient rainfall but if it cannot be done then, it should be left until the end of August or September. They will do better then than if planted in June or July, as the ground in those months is cold, and the small roots are likely to perish. Deciduous trees do as well planted in August as at any time, because they are dormant during the winter months.

Planting time having arrived, the trees should, if possible, be got direct from the nursery and planted as soon as possible, as they can gain nothing by being out of the ground even in the most favorable weather, and will lose much when the weather is dry. For this reason I would advise that none but South Australian grown trees should be planted, because those imported from the other colonies never do well, or, at least, it is years before they thoroughly recover.

Planting should be done when the weather is damp, but not when the ground is very wet, because ground worked when in a very wet state is apt to bake, and the growth of the roots will be much hindered. When filling in the hole the soil should, if possible, be mixed with some well-rotted manure, vegetable or leaf mould, and filled nearly to the level of the ground, having the centre a little higher than the outside, so as to give the roots a downward tendency; the tree may then be placed in position, and the roots laid out round the tree. If the roots are laid all on one side it will cause the tree to grow to one side, and will be apt to blow over if in an exposed position. If a mixture of leaf mould and sand can be had, a shovelful or two over the roots will be of great advantage, as I know of nothing that roots will lay hold of sooner. The soil may then be levelled in, and the work is so far completed; but care must be taken that the tree is not lower than the ground around it. I cannot close without strongly condemning the practice of planting down a hole—that is, having the ground around the stem four or six inches below the general level, in order to catch the water, which soddens the soil that has been moved, and when dry, bakes and becomes impervious. More trees die from this cause than all others put together.

Trees will be much benefited by a good mulching after planting, especially those planted in September.

PEACH-GROWING.

By Mr. E. M. Sage.

Where the rainfall is at least 15 in. annually, the peach does best on a free soil with a substratum of limestone rubble, but, as far as ascertainable, does not do well on either a stiff clay or a deep sand, where the apricot does best. It is a great mistake, but a very common one, to dig deep holes for tree-planting. I consider 9 in. to 12 in. as deep as needful, but as large a surface may be moved as one feels inclined to do. Cultivate deeply as early as possible in the winter, letting in the rain to the subsoil, and in the spring scarify as often as possible, but not more than about 3 in. deep, and so retain the moisture in the soil. The best kinds to plant in a dry climate are those that carry the fruit wood nearest to the older wood, as they can be pruned shorter. Thus the tree is kept more compact, and has not any surplus surface of leaf or limb to suffer from evaporation. I have had to work over several kinds that carried to the fruit buds towards the ends of the shoots, as they never matured properly, but were always dry and undersized. I have one tree that I have left as an object lesson, both for myself and visitors, and has never borne a good marketable sample, whilst the kinds named below have always borne quite as good crops of a far better quality. The clingstones do not do here at all, being always dry and woody. The kinds I would recommend are Early Beatrice, Briggs' Red May, Early Rivers, Early Silver, Foster, Crawford, Lady Palmerston, and Salway, ripening in the order named. Early Beatrice is a small peach, very thin skinned, but of first-rate flavor, and a very heavy bearer. It does not drop the flower buds, as a lot of the early peach trees are apt to do. All trees carrying a heavy crop should be thinned, as quality of fruit should always be considered before numbers, and a fine, well-grown peach is always much better flavored than a half-starved one. I prefer the peach worked on the hard-shell almond, either the bitter or sweet, but the soft-shell will not do at all. The trees may not grow as freely as on the peach stock, but I have the same kind of peach (Early Silver) on both stocks side by side, and the trees worked on the almond stock beat the others both for quality and quantity of fruit; in fact, one dry season the fruit on the peach worked on peach were very poor in comparison with the peach on almond. Very few of my peaches are worked on peach, and I have more trouble with aphis on the few I have on peach than on nearly 200 on almond stock. When purchasing trees, get, if possible, those only one year from bud, as they can be headed low, say, 15 in. to 18 in. high, which is better than a high stem, and two-year-old trees are generally shaped in the nursery to 2 ft. or more, and carefully disbudded below the head, so that it is almost impossible to work them back. Younger trees, too, have smaller roots, and so heal over quicker and better where they have been cut, which is a consideration where white ants are bad. In pruning, the primary object should be to shape and stiffen a young trees regardless of fruiting. When planting, prune to a straight stem not more than 18 in. high, and during spring suppress all shoots but four or five at the top. Next winter leave, say, three of these in best position, pruning them back to about 6 in. or 9 in., and the next year leave two on each of these if you can get them in a good position for shaping the tree. I think six to eight main arms are quite sufficient to have on a peach at any time, so that the third year I only leave about one on each of the previous season's arms, and leave a certain amount of fruiting wood, as a little fruit the third year will not hurt a peach tree. Prune all lateral growths by the fruit buds if they are plentiful and close to the older wood. I prune shorter than if they are scanty and situated further out. It must be borne in mind that the peach does not form what may be called permanent fruit spurs, but bears its fruit on last year's wood, and only once on the same wood. The great object should be to get a peach tree as full of vigorous young wood as possible if regular good crops are to be expected. I am not in favor of much summer pruning, as the growing season here is too short, and, if a shoot is pinched back, in some cases it does not start again, or, if it does, it makes only a few short spindly growths which are no good. I only look out for shoots that are growing where they are not wanted, and suppress them altogether as early in the spring as possible. If a tree is growing too strong on one side a strip of bark taken out of half-way round the limb that is running away from the others will check it, and is preferable to pinching back the top.

ALMOND TREES.

By J. F. Pascoe.

"In travelling through different parts of the colony one cannot but notice the display of improvidence exhibited as a rule by our colonists, and how sadly neglected are many of the 'minor industries' that would not only add comfort to people's homes, but bring considerable pecuniary help, the carrying out of which would not interfere with the ordinary routine of life. nor entail more than a little cost or trouble after the first outlay and start, and might even be made a source of pleasure to all, but more especially the younger members of families. I think it is John Stuart Mill who says, 'Give a man seven years' lease of a garden without restriction, and he will make a desert of it; but give him the freehold of a rock, and he will turn it into a garden.' I am sorry to say colonial experience does not tend to prove Mr. Mill's assertion, for the bulk of the freeholds in many parts of this colony have not much of the appearance of gardens, and during a portion of the year, except for fences, dilapidated huts, and miserable sheds that have to answer the purposes of stables, barns, and outhouses, the country has more the appearance of a desert. In some instances this may be to an extent excusable, but generally it is most discreditable to the settlers. Were they a little more thrifty, and made good use of some of the time that is often worse than wasted. or hangs heavily on their hands. then, if their wheat crops failed, they might have a little to fall back on to keep the wolf from the door, besides inculcating habits of industry in their children. How often do we see a homestead exposed to the fiercest rays of the sun and the blast of the north wind. and miles of country with not with a ruthless savagery until there is scar- even a tree or bush planted for shelter either to man or beast—in places, too, where the outlay of a few shillings and a little care for a season or two at the most would have given plenty. The trees that were growing have been exterminated

SPRING.===THE ALMOND TREE IN BLOSSOM.

KINDLY LENT BY THE PROPRIETORS OF THE "CHRONICLE."

cely one left to serve even as a rubbing-post for cattle. The reason for this might perhaps be easily shown, though it is not my intention to discuss it at present; but when we see upon what small plots of ground the inhabitants of England and Continental nations manage to make a comfortable subsistence, at times paying high rents, it must force us to the conclusion that the large areas we grant (and will most probably increase) to individual settlers is not an unmixed good. I have no hesitation in stating that there is no part of our colony that will produce cereals which will not also grow trees, shrubs, or plants of various kinds that would tend not only to protect and beautify the homestead, but give protection to cattle, bring profit to the general fund, give pleasure and amusement to the family, generate feelings of patriotism and loyalty, elevate the mind, and improve the manners of the rising generation, and generally help to increase the comfort and happiness of homes, and make lives more worth living. The 'minor industries' must of necessity depend on soil, climate, and surrounding circumstances; but there are two at least that may be attempted with a great chance of success by our settlers and farmers in all but the very coldest situations. I allude to the growth of the almond and olive; but, except to bear testimony to the great usefulness of the olive in the economy of farming, its hardiness, the small amount of cultivation necessary, its great value as food for poultry, sheep, pigs, and even cattle, and the high position it is destined to take among our commercial resources, I do not at present intend to allude to it. I will, therefore, confine myself to the cultivation of the almond. I use the word 'cultivation' because there is a widespread opinion prevailing that almonds do not require to be cultivated—some will assert that it is detrimental to them; but this is a most fallacious doctrine, for although hardy, few trees are more susceptible of kindness, or would give better returns for a little care and nourishment. It is rarely that it has a chance to succeed; it is generally only planted in situations not considered good enough for ordinary fruit trees, and when planted is supposed to take care of itself without pruning or any attention whatever. Its original habitat is ascribed by some authorities to Syria and Arabia, others to Barbary and Morocco, and again to Asia Minor; but wherever it may have been, at a very early date it became acclimatised over a vast extent of territory, and is now grown more or less in all the warm and temperate portions of the world. It first came into notice when Jacob sent his sons into Egypt; we next meet with it when Aaron's rod budded, blossomed, and brought forth almonds; and the decorations of the Tabernacle were 'fashioned after the manner of almond branches.' It is often mentioned by ancient writers, and occasionally met with in mythology. Although so long in favor, it does not appear to have been generally cultivated in Europe, excepting Greece (Cato, B.C 300, calls them Greek nuts), until comparatively recent times. I can find no authentic account of the time it was introduced into Italy, France, and Spain, but the first almond tree planted in England was planted in the reign of Henry VIII., 1548; but although commonly grown there, it is more as an ornamental tree than for the sake of its fruit, as it is only in mild genial seasons that it ripens, and then is of inferior quality. Until recently the almond and peach were classed as species of the genus Amygdalus, but of late years authorities have separated them, forming a distinct one (Persica) for the peach, retaining the original for the several species of almonds. The botanical difference exists chiefly in the pericarp, but appears sufficiently permanent to render its separation desirable, although there can be no doubt the distinction is not aboriginal, for we often meet with almonds that can scarcely be distinguished from peach stones, and others with pericarps of considerable substance. For trade purposes they are generally divided into three classes—hard-shell, soft-shell, and bitter. The bitter almond contains a large percentage of prussic acid, is very poisonous, and chiefly used for chemical and medicinal purposes, though to a small extent for flavoring confectionery, soups, &c.; but it should in all cases be used with extreme caution. The flower is generally larger and whiter than the common, and it is held by some writers to be a distinct species from it, and that it can only be produced by its own seed; but this is doubtful, as many growers in this colony assert that they often raise bitter almonds from sweet seed. There is no apparent difference between it and the common hard-shell, and it can only be distinguished by the taste of the kernel. Hard and soft shells are of the same species, and the seed of the latter will often produce the former; but it is seldom the former will produce the latter. The only difference in them is that one has a hard tough shell, and the other a soft friable one; although generally the kernels of the hard-shells are sweeter and proportionately larger than those of the soft, and they usually undergo the process of being shelled before being taken to market, and as a rule are the produce of unworked seedling trees, none that we have fruited possessing merits of distinctive attributes sufficient to be considered desirable sorts to perpetuate. The most valuable hard-shell is that known as the Jordan—a long roundish variety with a sharp point turned a little to the one side. It was introduced into this colony by Dr. Schomburgk. Soft-shells are grown to a greater extent, and in immense variety, but the most popular is that known as the Brandis—a chance seedling raised about four miles from Adelaide in the early days of the colony by the person whose name it bears. The tree is distinct from all others, being of upright growth, with clean wood and fine foliage, the fruit large and handsome, and the kernel very sweet, with a delicious flavor. It is the most marketable variety we have, and always realises the highest price. There are many others propagated, and known as Paper-shell, Picnic, Nonpareil, Murray's Seedling, &c.; but the beauty of the tree and the properties of the fruit of the Brandis are such that persons planting rarely plant any other, and the popularity of this variety is not merely local, for in all the colonies it is held in the highest estimation. It is, in fact, the only soft-shell almond we can export with much advantage, some of the colonies refusing to take any other. In early spring the almond is one of the most conspicuous trees in our gardens, being the first to come into flower. For this reason it is commonly grown in England as an ornamental tree, and I have known instances where the owners have been very proud of their few sickly-looking, blighted specimens, and treat them with the greatest amount of deference and care; but as an ornamental tree it will never be esteemed here. We look upon it merely as a medium of profit, and insist on securing that profit with the smallest possible outlay. It rarely ever gets a chance to succeed, and although other trees are often killed with kindness, I doubt if ever an almond-tree suffered from that cause, though we have innumerable instances where they have died of sheer neglect, being literally starved to death. Proverbially it is a gross feeder, and for this reason if kept without food, of necessity has to send its roots long distances on foraging excursions, and is condemned for trying to carry out Nature's first law; schemes of all sorts are resorted to for the purpose of keeping it within bounds, but the most simple and effectual of all, that of providing it with nourishment, is rarely tried. We have vast tracts of country eminently adapted for the cultivation of almonds. In the suburbs of Adelaide, from the foot of the hills to the coast, and for several miles south they do remarkably well. Going northwards, they flourish admirably on the flats and sunny slopes to a considerable distance beyond the Burra—notably in the vicinities of Salisbury, Gawler, Freeling, Angaston, Clare, Auburn, Farrell's Flat, and Saddleworth. At Yarcowie and Terowie, and the country lying to the north-east, they are not a success, but at Melrose, Wilmington, on to Woolundunga, Pichirichi, Quorn, and Horrocks' Pass they again thrive in a remarkable manner, and most probably would at Hawker and Cradock. The greater part of Yorke's Peninsula and several districts lying to the north of it should suit them well. At Belalie, Caltowie, Booleroo, Gladstone, Gulnare, Narridy, and Yacka I am informed they grow luxuriantly. Among the slopes of the Mannanarie Ranges, in the district of Tarcowie, at Napperby and Wirrabara, they are doing well. On the whole extent of country lying to the west of the Flinders Range they ought to succeed splendidly, besides a host of other places and districts—in fact, except in situations that suffer from severe early frosts or a continuation of intense cold, they are well adapted for general cultivation. The question then arises, will they pay to grow, and, further, will they pay to cultivate? In southern Europe they are cultivated in immense quantities, and attend to as carefully as a peach orchard or an orangery. There, in many instances, almond plantations have proved most valuable investments, and I know of no valid reason why they should not be just as remunerative here. Of all the Australian Colonies this is undoubtedly the one in which the almond succeeds best. All the others draw on us for a portion of their supplies, and would take more if we could spare them. With most fruits the extent of the crop very materially affects the price, but not so with the almond. The practicability of shipping almonds to England has often been discussed, but, excepting the Brandis and Jordan, that market is entirely closed to us—not that it makes any difference, for we do not want it, nor shall we for the next twenty years. The highest price, as far as I know, that the Brandis realised there was 10d. per lb., but that price is exceptional, and scarcely covers risk, expenses, and duty. McCulloch says almonds are among the most grossly overtaxed articles of the British tariff, and considers that if they were made reasonably low the consumption would increase fivefold. What is the commercial value of an almond-tree in this colony cannot easily be determined, for, although we have been growing almonds for so many years, very few persons take the trouble to calculate the profit or loss on them; but there is a very current opinion circulated by the majority of growers that 'they do not pay.' Now this is a very vague expression, and those who use it have very hazy notions of its meaning. As a matter of fact, I scarcely ever knew of a horticultural or agricultural product that from the producer's view did pay. I have several times tried to estimate the average crops of almond-trees grown under fair ordinary conditions, but my success has not been very marked, as so few are grown but which are heavily handicapped—planted as hedges for break-winds, or purposes of shelter at ten feet apart, the average yield in the neighborhood of Adelaide appears to be, for soft-shell (especially the Brandis) about 10 lb. per tree, and less or more as the distances between the trees are diminished or increased; but as a rule they are entirely neglected, and often have a road on one side. I am informed on good authority that the yield is much higher in some of the northern districts, but think 10 lb. quite sufficient to base our calculations upon. Cultivated trees, or trees grown on cultivated ground near the metropolis, are so rare that we cannot take them into consideration; but on the plains and sunny slopes between this and the Burra, when trees are in healthy condition, and have some little attention paid to them, about 20 lb. is reckoned a fair average yield, and that is about the quantity suburban growers used to expect. Instances of extraordinary yields by individual trees are not uncommon, often 80, occasionally 100, and in a few instances about 112 lb. are said to have been produced by single trees in one year. Hardshell trees are more prolific than the soft, and yield from 30 to 50 per cent. more in weight per tree. The almond is not a large growing tree, and in ordinary plantations should be 16 to 18 ft. apart—16 might do for the Brandis, but I would prefer 18, or 134 to the acre. The fruit is produced on the young wood of the previous year's growth, and on spurs of from two to four years' growth. The best trees to plant are those from one to two years old. About the third year after being planted they will begin to produce a little fruit, and annually increase the quantity until they arrive to about ten years of age, when they ought to be almost full-grown, and producing with ordinary care average crops of 20 lb. of soft-shell, or 25 to 30 lb. of hard-shell; but I am fully convinced these quantities may be considerably increased with extra, or what is called high, cultivation—that is, properly pruning, manuring, mulching, &c. If trained to standards of about two to two and a half feet from the ground, the plantations would make admirable runs for fowls, ducks, and geese, and, for certain portions of the year, for pigs and sheep. In America it is often found most advantageous to occasionally turn sheep and pigs into orchards and fruit gardens; and no one will deny the great good done by poultry among fruit trees in this colony. Taking the above figures as correct—and I am quite satisfied the estimate is not too high—it will be an easy matter to calculate the value of the produce of an acre of almond trees. One hundred and thirty-four trees, at 20 lb. each, gives us 2,680 lb. If the Brandis variety is grown, they will realise 6d. per lb., or 67; but taking the quantity at the very low estimate of 15 lb. per tree, it will give us 2,010 lb., or £50 5/. Hard-shells would not show so favorably. One hundred and thirty-four trees, at 30 lb. each, 4,020 lb.; these, at 14/ per cwt., would realise £25 2/6; or, if broken, and the kernels sold, 4,020 lb. of nuts would produce about 1,200 lb. of kernels, which, at 9d. per lb., would amount to £45; but from that amount we must deduct 2d. per lb. for shelling, amounting to £10, leaving a balance of £35. This even is not a bad return. The harvesting and drying takes place in the latter part of February, and during March and April. Several acres of Brandis could be easily managed by ordinary families with very little extraneous help, as at that time farmers are not very busily engaged. Drying almonds in this climate is a simple process. After a few days they may be put in bags and stored away, to be husked and prepared for market at leisure. It may be asked what guarantee is there that the above prices will be maintained? I can only say that during the last twelve years they have increased in price gradually about 50 per cent.

SAGO TREES.

Sago is produced from a variety of plants. It may be made from the Australian Macrozamia spiralis and the Cycas media. China, Japan, and the West Indies furnish plants from which a kind of meal or starch, which is converted into a kind of sago, is obtained. Commercial sago, however, is obtained from the trunks of two distinct palms—the Metroxylon sagu and the Arenga saccharifera. The first-named palm seldom lasts more than from 15 to 20 years, when the tree flowers and dies. An enormous number of flowers are produced, but comparatively few fruits are formed, and a still less number of seeds are perfected. The quantity of commercial sago obtainable from one tree of this species is enormous, averaging up to 500 lb. or 600 lb., and it is recorded that as much as 800 lb. have been obtained from a single tree. It has been further estimated that three sago palms, of average size, will yield more food than an acre of wheat and six trees more than an acre of potatoes. To obtain the sago-meal the trunk is cut down and split up into longitudinal segments, the cellular or pith-like centre is scraped out and carefully washed; the water in settling deposits the starch, which is moistened into a pasty-like mass, and pressed through sieves of different meshes, thus producing the granules so familiar to us as commercial sago. The granules are dried and packed for export. The importance of sago-meal as food has been exemplified by the statement that 2½ lb. of bread made of this meal is sufficient for a day's sustenance for a healthy man employed on hard work. Several of the sago palms are found growing in the Melbourne Botanic Gardens, but the climate is much too cold for the cultivation of the more valuable kinds.

Vegetable Garden.

OPERATIONS FOR SEPTEMBER

PRACTICAL VEGETABLE GROWING.

By W. S. Campbell.

The month is a busy time for those gardeners who have not looked ahead sufficiently far enough to be prepared for the early sowing and planting of summer, or tender vegetables. Possibly the early half of the month will be cold and frosty generally, consequently much care will be necessary if plants as tender as tomatoes, cucumbers, capsicums, egg-plants, &c., have been planted out. At nights such plants need to be protected, but the protection can be removed in the mornings and the plants encouraged to grow strong and hardy.

Heavy rains generally fall some time about the middle or the end of July, giving the land a thorough soaking. This year we are, at time of writing, in the midst of a general downpour, with probably more rain to follow. This good soaking will prove extremely beneficial for some time to come, and give a favorable start to spring vegetables.

There will be a deal of planting and sowing to carry out from time to time during the month, both in the vegetable and flower gardens.

Asparagus.—Directions were given to prepare for planting in the early spring, and if those directions have been attended to, there will be but little difficulty in carrying out the planting at convenience during the month. When lifting the young plants, if they have been raised from seed, endeavor to avoid, as much as possible, breaking or injuring the roots. Should plants be purchased, a good many roots will probably be found broken and injured. Remove all half-broken roots and trim the ends of those that are broken. Dig out a wide, shallow trench, sufficiently wide to allow of the roots being spread out, and make the bottom of the trench concave, so that the crown of the plant may be set higher—2 or 3 in.—than the ends of the roots. Set the plants about 2 ft. to 3 ft. apart. Sometimes they are planted closer together, but a good distance apart is advisable, especially if the soil is rich. Old asparagus plantations may be cleaned up, and dressed with a good dressing of manure. A little nitrate of soda, say at the rate of 1 cwt. to the acre, will be found advantageous with the farmyard manure.

Artichoke, Jerusalem.—At any time during the month some tubers may be planted in trenches 6 in. deep and 3 ft. apart, and set the tubers about 1 ft. from each other. This is an excellent vegetable, and should be grown in every garden. It is valuable for stock, particularly for pigs, and is well worth growing on a large scale where any may be kept.

Artichoke, Globe.—Suckers or rooted plants may be planted at any time, but it is not a vegetable that can be highly recommended.

Beans, French, or Kidney, Scarlet Runners, and Snake Beans.—May be sown from time to time in gardens where frosts are not likely to appear. The French bean is well known to almost every one, and its cultivation is about as easy as anything could possibly be. Sow in rows 2 ft. 6 in. to 3 ft. apart, making trenches or drills 3 or 4 in. deep, then drop the seed into these drills about from 4 to 8 in. apart, and cover with soil. The Scarlet Runner is not frequently to be seen now. Some years ago it was extensively grown, and notwithstanding improvements in other beans, this one time favorite is worth growing. It is a handsome creeper, and may be made use of for a quick-growing shade, for verandah or trellis. The Snake bean bears very long thin rounded pods, excellent when used young, and worth growing. This is a climber. Other beans are the Limas, dwarf and tall, both being most useful vegetables, the variety known as King of the Garden being about the best of the Limas. One of the best of the dwarf French beans is the Canadian Wonder. A very good variety is Carter's Jubilee, which was tested last season, and which gave satisfactory results. The varieties known as Butter or Wax beans are stringless, and well worth growing. Golden Wax is one of the best to try. In the coldest districts of the State Broad beans may be sown, but in warmer districts this bean is not likely to thrive during the summer.

Beet, Red.—A short row or two should be sown two or three times during the month. An endeavor should be made to keep up a supply of this useful salad-vegetable during the summer months. The Globe varieties will be found the most satisfactory to grow. When the seedlings are an inch or so in height, thin them out well. The seed sometimes comes up much thicker than may be expected, and the sooner the young plants are separated the better.

Beet, Silver, or Spinach.—This is one of the most useful and reliable of vegetables to grow for summer. If the soil is well prepared and heavily manured, this beet should grow to perfection, and will last for months, if not for years, if the leaves are carefully gathered, and not too many are taken from a plant at a time. Seed may be sown in rows, or in a seed-bed, whence they can be transplanted when large enough. The plants should stand about 18 in. to 2 ft. apart, the richer the soil the wider apart.

Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Savoy.—Sow a little seed of any of these members of the Cabbage family, from time to time during the month. Plant out any well-matured seedlings, about 4 to 6 in. apart, and when these have grown into strong plants transfer them to the permanent quarters. Make the soil of the permanent beds rich with well-rotted, not fresh, manure. Use care in transplanting, and injure as few roots as possible.

Celery.—Some plants should be raised from seed for planting out in trenches, when they are large enough to move. Very little seed may be sown occasionally, for this vegetable is not likely to be required in any great abundance. The soil in the trenches should be made as rich as possible, for celery is a greedy feeder. The trenches need not be deep, for the celery can be best and most easily blanched by means of boards, bark, haulm, &c., and the plants will be blanched just as effectually as if they were earthed up in the common manner. The earthing up system can, of course, be adopted if most convenient.

Celeriac or Turnip-rooted Celery.—A useful variety of celery and much easier to manage than ordinary celery. Sow a little seed occasionally in drills. The soil should be rich, or made rich for this vegetable.

Carrot.—Seed may be sown as extensively as may be required, from time to time during the month, in drills about 1 foot apart. Rub the seed well before sowing; unless this be done to break the little hooks it is liable to stick together and come up irregularly and in clumps.

Cucumber.—Plants which have been raised under protection may be planted out wherever late frosts are not likely to destroy them. Seed may be sown in the garden as largely as may be required in all warm climate districts.

Leek.—This is a useful vegetable, which should be grown in all gardens. It needs abundance of good manure and a good deal of moisture. Sow in seed bed, and when the seedlings are large enough to shift transfer to shallow trenches. Trim the roots when planting. The seed should not be covered deep when it is sown.

Lettuce.—Seed should be sown early in the month in seed bed, but after the young lettuces have been planted out, any further sowing should be made in drills where the lettuces are to grow, for during the warm weather lettuces transplanted from a seed-bed are more liable to bolt to seed than those which are not transplanted. The lettuce deserves attention, for it is a useful salad-vegetable and one of the best that can be grown.

Melons.—Seed may be sown from time to time; during the end of the month would be the safest time to sow, for there is always a risk from late frosts.

Onion.—It would be well to sow extensively during the month, and raise enough onions for home use, for if they be carefully raised without bruising, and strung, they should keep good for a long time. Sow the seed-drills in well-manured land, after making the surface as fine as possible. Be careful not to sow the seed deep. Merely cover lightly with fine soil.

Parsnip.—Sow from time to time during the month as extensively as may be required.

Peas.—Sow a few drills occasionally during the month, and endeavor to keep up a continuous supply for the table.

Potato.—Plant some early varieties, such as the Kidneys or Early Rose, or, indeed, almost any kind should grow well during the month, in most gardens in the State. The ground should be well drained, heavily manured, and well dug up. Plant in rows about 3 ft. apart, and set the potatoes about 1 foot apart, about 5 or 6 in. deep.

Radish.—Try several varieties, Globe as well as long rooted, making several sowings during the month.

Rhubarb.—Plant towards the end of the month, as many roots as may be required, of two or three varieties, including that known as Tops Winter. The soil should be well manured before planting. Set the rhubarb 3 or 4 in. apart, keeping the crowns about 3 or 4 in. below the surface of the ground.

Turnip.—Sow occasionally seed in drills about 1 foot or 15 in. apart. A few Swede turnips also should be grown for the table. These can be raised in a seed bed and transplanted like the cabbage, if this method of growing should be the most convenient.

Tomato, Egg-plant, Capsicums, and other tender vegetables may be planted out in warm climate districts, and seed may be sown either in the garden or in seed beds under some protection for later planting purposes.

N.S.W. Agricultural Gazette.

EL DORADO POTATOES.

£448,000 PER TON.

The above heading is rather startling and may be met by an incredulous curl of the lip, but we extract the particulars from "Chambers' Journal" for July, in an article entitled "Romance of the Potato." We are not accustomed to look upon the potato as a priceless gem, but the following article certainly lends a romance to the modest potato which lifts it considerably out of a common kitchen garden status of regard. The writer goes on to state that "in the spring of 1903 not a little surprise was felt when it became known that a novel variety of potato was being eagerly bought up for planting at £1 a pound, the usual price of seed potatoes being from £2 to £4 per ton. A still greater surprise was awaiting at the end of the year when tubers of another variety—El Dorado—were sold at prices ranging from £100 to £200per lb. avoirdupois. As numbers of potatoes average two to the pound the altogether remarkable sum of £100 must have been paid for many of the single tubers. It must be a puzzle to the general reader whose knowledge of this humble esculent does not perhaps extend beyond a daily renewal of acquaintanceship with the cooked article, and to whom all potatoes are alike, to understand how such things can be. It will partly explain the matter if we say that during the last 30 years potato growers have been continually on the lookout for improved varieties of the potato—varieties producing larger crops and unsusceptible, or slightly so, to disease. So remarkable has been the success of potato specialists, whose business it is to produce from the potato apple new varieties, that whereas formerly 6 tons of tubers to the acre was considered a fair crop, in 1903 the sort called Evergood produced from 14 to 18 tons, and in a year when disease was more than usually prevalent the crops of that sort were quite clean. Evergood had of course made its name previous to 1903; but when the specialist who produced this variety declared that he had succeeded in obtaining a superior variety to that which on trial produced such enormous returns as, roughly, 1 to 1½ cwt. from a pound of "seed," with 50 to 90 tubers to a single plant, the desire to secure such an extraordinary prolific potato can easily be understood. What is said to be an even superior variety came into notice during 1903. It was to be sold to the public in 1905; but a few pounds grown in England got upon the market and sold at the price already quoted. Orders are being solicited for the autumn of 1904 at the reasonable price of five guineas a pound, or, for the ton the alluring figure of £11,760. The present value at £200 a pound avoirdupois is the startling one of £448,000 per ton, and what a field of a few acres in extent planted at these prices would be worth is too stimulating to contemplate.

No doubt it will occur to those of an enquiring turn of mind to ask how potatoes costing £200 a pound for planting can be made to produce a paying crop at five guineas. The cost of production need hardly be considered, as the prices are so abnormally large as to be unaffected by rent or wages. It is clear that if only 1 cwt. is secured from each lb. planted the crops at five guineas a pound will amount to £558, yielding a not unhandsome profit.

Astute potato cultivators have reverted to a method tried some 60 years ago, whereby the seed potato is made to provide a large number of sets. Usually the potato tuber is prepared for planting by cutting it in pieces, each provided with one or more growing "eyes" which become the potato plant. By starting these "eyes" or shoots into growth by means of artificial heat they may be removed when large enough and rooted in flower pots, and when these have grown somewhat the tops of the shoots may be cut off and also rooted in the same way, and so on till the advancing season renders it impossible to proceed with profit. Meanwhile the tuber produces more shoots, which in turn are treated as above; and once this method of propagation comes to an end the tubers themselves are utilised for planting. By these methods the producing power of a tuber is increased according to the number of times each shoot is increased, hence it is apparent that by a comparatively small outlay the value of the crop can be increased to an enormous extent.

No potato has ever gained so much variety as El Dorado, raised by the famous Scotch grower, Mr. A. Findlay. of Markinch. There was considerable excitement in Peterborough market over the sale of a specimen of the famous El Dorado potato. The potato weighed a little under ½ lb., and was disposed of at the record price of £80. The story of this potato, says the "Gardeners' Magazine," is quite romantic; the very name was a stroke of genius. The promise fulfilled by Northern Star assured for El Dorado a hearty reception; but the output of seed was so small and the competition for tubers wherewith to raise stock was so great that the price bounded up. Mr. George Massey, of Spalding, was one of the very first to obtain stock, and from him Mr. Z. Gray, a well known grower at Everton, purchased a stone weight for £20. This set the ball rolling, and as Mr. Findlay resolved not to further distribute El Dorado until the autumn of 1904 the demand for the small stock available was doubled and trebled and so the prices rose. Messrs. Dennis, the Covent Garden salesmen, and Messrs. I. Pond & Sons, of York, possessed supplies, and the latter firm found a purchaser of 4 lbs. at £150 per lb. This determined them to obtain further stock, and so at Smithfield Club Show a member of this firm, finding that Mr. Massey had a limited stock for disposal, made an offer of £1,000 for a stone. Mr. Massey refused, as he wanted £1,500, but eventually the bargain was struck at £1,400. Subsequently Mr. Massey sold a relatively small quantity for £2,000, so that his original transaction brought him a very handsome return."

Some people are enquiring how so many potatoes can be used when at present the crops in a favorable season produce a glut in the markets, and prices are so low that margin of profit to the grower comes sometimes perilously near the vanishing point. As in many other cases it would appear that also in this an outlet is waiting for any increase in crops that may occur. Potatoes are already being used in the production of petrol, at least one large factory being in course of erection for the transformation of the tuber into oil. As to whether these abnormal prices are likely to be maintained no one can say; possibly they may for a year or two, but it can hardly be for long.

A Musical Education for Half-a-crown.

The above heading will, of course, appear to most people as the height of absurdity; yet the absurdity is more apparent than real. It goes without saying that a finished musical education in the regular course cannot be had for half-a-crown, or even with several hundred additional half-crowns; but can it be truthfully said that the person with a sufficient knowledge of music to play accompaniments on the piano or organ, to all the popular songs of the day, has no musical education? Assuredly not. A musical education, sufficient to enable one to play accompaniments to the home frequently, gets and gives more pleasure from the modest accomplishment than does many on whose education large sums have been expended.

To the more modest musical education the above heading applies. Such an education "The Australian Gardener" is now offering its music-loving readers for half-a-crown, believing that it is the greatest benefit we can give our subscribers.

This ready-made musical education consists of Pratt's Chart of Chords for the piano and organ, which is the nearest approach to the ready-made knowledge of music yet attained by science.

It is a short cut to harmony, and is to music what the multiplication table is to arithmetic, a quick method of learning to play the piano or organ without a teacher.

With this chart any one can, with but a small amonnt of practice, become an expert pianist. It is a complete self instructor, enabling any one to play the piano or organ at sight, and to play, without difficulty, brilliant accompaniments to any song ever written. It is valuable to the advanced musician as well as the beginner, embracing nearly every major and minor chord used in music; and is endorsed by teachers and musicians everywhere.

This chart is the practical result of years of study by Charles E. Pratt, the noted American composer and musician, whose compositions have world-wide popularity, and a larger sale than those of any other American or European composer.

Believing that the educational value of this Chart cannot be over-estimated, "The Australian Gardener" has arranged with the publishers to supply Pratt's Chart of Chords (published at 5s.) to its readers at the reduced price of 2s. 6d. each, with 2d. added for postage, and in addition to the Chart of Chords the publishers have kindly agreed to send without extra charge a copy of the Coronation Musical Folio, containing 48 pages of sheet music, and instrumental by popular composers.

Every home that has a piano or organ, especially where there are children, should have Pratt's Chart of Chords.

This offer is made for a short time only, and "The Australian Gardener" readers should avail themselves of it without delay.

ADDRESS—"THE AUSTRALIAN GARDENER," Adelaide.

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Answers to Correspondents

A.J.W.—No. 1.—Ornamental Grass. Penuisetum longistylum, from penua, a feather, and seta, a bristle, feathered flower spikes. Introduced from Abyssinia.

No. 2. Thrift. Armeria vulgaris, Latin name for a species of Pink. From Europe. Sometimes called Statice Armeria.

No. 3—Daisy. Chrysanthemum leucanthemum hybrid. From chrysos, gold, and anthos, a flower. No, not Shasta .Send to Mr. Henry Sewell, Adelaide, for some Shasta Daisies, and you can then compare them.

No. 4.—Fern. Asplenium bulbiferum. Spleenwort, from a, not, and splen, spleen. From New Zealand. Supposed to possess medicinal qualities.

No. 5—Bulb. Ornithogalum candatum. Species of Star of Bethlehem. From ornis, a bird, and gala, milk. Same order as Lilies. Yes, Alliums, belong to the same order.

No. 6 —Blue. Not known. It appears to belong to the Buraginaæ, allied to the Forget-me-not (Myosotis). We shall be glad to receive a complete plant including the root.

No. 7—White Herbaceous. Probably Helleborus Orientalis. Hellebore, from heleim, to kill, and bora, food, referring to its poisonous quality. Introduced from Greece. There are several hybrids of this species.

No. 8 —Like carrot or parsnip. Heracleum eminens (cow parsnip). From heracles, a plant consecrated to Hercules. Introduced from Europe and Asia.

KAPUNDA FLOWER SHOW.

An advertisement elsewhere announces the first Show of the Kapunda Floricultural Society, to be held this month. The prize-list is good evidence that the Society is well patronised, and we are glad to note a special class set apart for professional growers. With such an enthusiast in Roses as Mr. Henry Dutton for their patron the Society should make a great show of the Queen of Flowers. We wish the Society every success.

The Flower Garden

OPERATIONS FOR OCTOBER.

FLOWERS.

The rate of growth in many kinds of flowering plants during September is frequently very great particularly when rain is frequent. The fresh, young foliage and numerous flowers make this time of year one of the most enjoyable to those who have an interest in gardening. Weeds must be kept in subjection, for they quickly outgrow any small garden plants if not checked as soon as detected. Edgings of box, or grass, or saltbush, or anything must be kept in order. Walks need attention to keep them free from weeds, and the growth of roses and other plants will require attention in the way of regulating their advancing shoots.

Numbers of bulbs and tuberous-rooted plants continue to produce flowers, but some of the early ones have completed their flowering, and if seeds are not required, their old flowering stems had better be removed and their leaves encouraged to grow as much as possible.

Before it besomes too warm any Bouvardias it may be intended to plant should be put out carefully ,and for a time had better be protected from the heat of the sun. A good watering should be given them after planting out from time to time should the weather prove dry. Old-established bouvardias should be well pruned and well manured, and they will produce flowers satisfactorily before very long.

Seedlings of half-hardy and tender annuals may be planted out almost anywhere, and biennials and perennials also, not forgetting the useful and ornamental petunia.

SEEDLINGS FOR PLEASURE.

Every enthusiast who is a grower and lover of flowers knows the peculiar pleasure derived from the growing of plants from mixed seeds. These are sown, the tender plants transplanted, and carefully grown on until the buds appear. Then the "wonder what they are going to be like" feeling takes possession of the gardener; and as the blossoms one by one expand and reveal their hidden beauties to the impatient watcher, his pleasure can only be imagined by those who have themselves experienced it. But this pleasure is infinitely increased when the cultivator sows his own seeds, and reaches its acme when those seeds are the result of his own patient attempts at artificial fertilisation. This process is much less difficult in many cases than most people think, but for those who lack the necessary knowledge, patience, or time there are, fortunately, many beautiful subjects which give excellent results from home saved seeds.

Last year I planted four Pansies close together and saved a few pods of seed. Some seeds sown in the autumn have given two dozen plants worth saving. The four parents were distinct from each other, and no two of their offspring are alike, yet all are beautiful, and I am looking eagerly forward to the blooming of a larger batch of seedlings raised from the remainder of the seeds sown under glass this spring.

It has been most interesting to note how characters peculiar to individual parents have been combined in seedlings. Thus one of the original Pansies was a deep blue; another yellow, with deep brown blotches. One of the seedlings has the upper petals blue, and the lower yellow and brown. Of course, I do not claim that any are worth a name, or are perfect for exhibition, but all are beautifully marked, and very decorative. I intend to try the same experiment with a few named sorts.

Among other plants the following may be mentioned as suitable for this purpose:—Hollyhocks, Foxgloves, Antirrhinums, Aquilegias, Pyrethrums, Anemones, single Dahlias, and Carnations; but I think the most satisfactory of all are the Pansies and Violas, as on their broad, flat blooms dozens of shades of color, and all kinds of marvellous tracery, are often exhibited. In the case of all the flowers mentioned it is only necessary to bloom a few near together, and the insects will perform the process of cross-fertilisation for you free, gratis, and for nothing. The more distinct from each other the colors of the selected flowers are the better will be the results.—J. W. D.

BORDERINGS.

Some time ago I was asked in a garden where I was giving temporary help if anything could be done to lighten the work entailed by the many long grass borders. The garden was on the side of a steep hill, and the soil was heavy to work. To cut the grass edges of the drive took two men and twice the usual time. Box entailed clipping, and Berberis, though suitable, was untidy just when the house was full of visitors. It was only used for summer, and the main thing was the winter and summer supply of vegetables to both town and country houses. I finally decided on a double row of strawberries from top to bottom of the drive. Last year runners of Royal Sovereign, Elton Pine, and Dr. Hogg were the varieties. They were planted 1 foot apart in rows 6 inches asunder, keeping the varieties distinct. In all it took 400 to each row. They were hosed twice, and by the time I came away were making brave progress. The turf came in handy for a tennis lawn bank in need of repair. Behind the strawberries, having got a cheap quotation, 200 Archie Grant and 200 Forerunner Violas were planted. These are two of the beautiful dark blues so popular nowadays.

The next grass border was round the shrubbery planted against the windy side of the house, and matching this on the other half of the front of the house was a bed of bushy Ayrshire Roses with clipped Sweet Briers. Facing these there were a border and a large bed planted with bulbs and self sown with Calendula. These borders were also taken up and trenched, and I decided that nothing could be better than Pinks. Round the shrubbery sides 200 or so of Alice Lee were planted rather closely together. Nothing grows with its accustomed rapidity in a bleak, wind swept district, so the closer planting was necessary to give a compact appearance. Then facing the house in a warmer, sunnier position 200 of Mrs. Sinkins were put in. As taking off the grass had hardened the shrubbery beds they were planted with yellow Viola Stephen and Nasturtium Golden King.

Next year another border round the kitchen and scullery domains is to be lifted and planted with Berberis, continuing a like border already in round a Spanish Iris bed. The long walks of the kitchen garden must, when the plants are in bloom, be a sight to gladden the garden lover's eye, for they are bordered solidly, some 6 inches deep, with Saxifraga umbrosa. To look along the tossing pinky sprays must be a fine sight; it is a joy to the owner. The herbaceous border is kept tidy by alternate lines of Thrift. This is to be carried on to the other side of the drive facing the strawberry border.

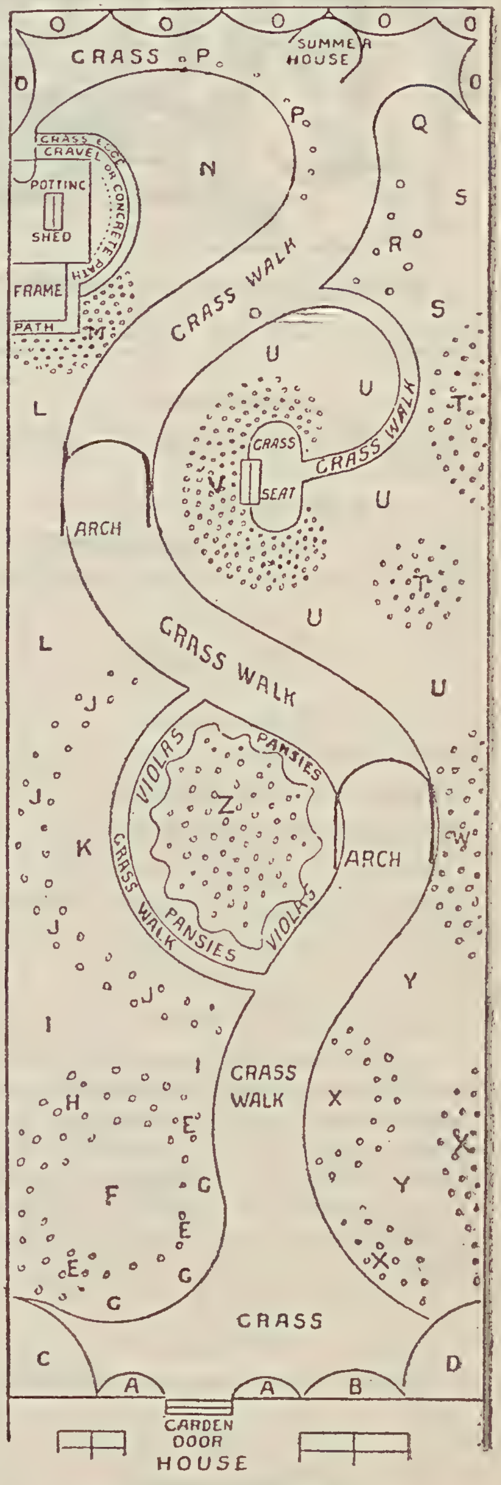
Strawberry runners are easily rooted, and a good supply can be got very cheaply. They pay for their cost in fruit, and, unlike many other borders, can easily be trimmed up by an amateur gardener, and the leaves alone are worth the trouble, for they are delightful to look on. An invisible string under the bigger leaves stretched rather high up from a peg at either end will keep the fruit from the soil.—D.

LANDSCAPE GARDENING.

Landscape gardening, in a place reckoned by acres, consists merely in assisting nature; that is to say, to heighten and improve the natural effects there presented, and reproduce others, the counterparts of which might be found in a ramble through woods, or over hill and dale, or along winding streams; blending the whole into one grand picture, with everything in perfect proportion. It is not expected that theese imitations of nature should be literal reproductions; such effects are neither possible nor desirable.

One eminent English authority, speaking of such a garden, says: "No ingenuity can convert it into a forest glade or glen, nor is such a transformation to be wished for, were it possible, any more than a dwelling should be transmuted into a hut, or a den, or a cave. A garden is for comfort, and convenience, and luxury, and use, as well as for making a beautiful picture."

Professor Bailey, writing on this subject in his "Cyclopedia of American Horticulture," says: 'The motive of a true landscape garden, as already explained, is to make a picture. The picture should have a landscape or natural like effect. The place should be one thing: it should emphasize some thought or feeling. Avoid



A Plan of a Pretty Garden.

scattered effects. Bunch or mass the planting. Distinguish sharply between the fundamental and the incidentals, those things which are to give the character or tone to the place, and those which are embellishments or ornaments.

Keep one or more spaces open. Plant the sides or boundaries with masses. Use single or individual plants only to emphasize or to heighten an effect, not to give it character; they are incidentals. Ornament should be an incident. Foliage is a fundamental. Greensward is the canvas on which the picture is spread. Plants are more useful for the positions they occupy than for their kinds. Walks and drives are no part of a landscape picture; they are a necessity, but they may be made to conform to the spirit of the picture.

The place for walks and drives is where they are needed, otherwise they have no use or purpose. It is the part of a good landscape gardener to make his grounds conform to the buildings: it should equally be the part of an architect to make his buildings conform to the landscape. Make views to desirable objects in the outlying landscape or the offscape. Obstruct the views to undesirable parts. Aim for a good prospect from every window in a residence, including the kitchen. Shear the trees and bushes when hedges, curiosities, and formal gardens are wanted: let them assume their natural forms when landscape garden is wanted. Place no tree or shrub until you are sure it will mean something."

On a small piece of ground you cannot do much in a general way to imitate nature, but you should still heed her promptings so far as is possible. It is just as difficult (though just as easy) to lay out and plant a city lot 50 x 100 ft., as it is a country estate of several acres, the principles involved are precisely the same. In the larger place we may have more details to engage our time and attention, but we also have a choice of several locations for desirable and necessary effects, for drives and walks, for large or larger trees, for bodies of water, and numberless other features necessary to the perfect harmony and completion of an extended acreage.

In the city lot of ordinary size the chief difficulty is the one most naturally to be expected—the impossibility of having all you desire in the way of ornamental details, and those you may have require a careful adjustment in order to effect perfect proportion. A small plat affords no scope for variety of treatment, and, therefore, it is well not to attempt too much.

Great care should be taken to hide all boundary lines, fences, walks, and drives from the house, the two last named being but necessary evils at best, and only tolerated because we cannot do without them.

1. Preserve open lawn centres. 2. Plant in masses, not isolated. 3. Avoid straight lines.

Though these three most important rules ,which must govern all true landscape gardening are quite comprehensive, they deal only with the great underlying principles, and leave untold much what to do, and what not to do in the ordinary make-up of a garden, and we follow them with a few pertinent suggestions:

Don't have—regularity of arrangement; large geometrical figures, out of all proportion to the size of the grounds; too many or too much, of walks and drives; unsuitable ornaments and oddities; a mixture of "styles;" rings of soil around trees and plants, by cutting out the lawn.

Avoid monotony, nature never repeats herself. Give your grounds somewhat of an air of shelter and seclusion; it will then appear restful and home-like.

BULBS FOR THE GARDEN.

By A. Campbell Johnston.

Bulbous plants are among the most beautiful ornaments of our gardens, and when well selected, some kinds may be seen in bloom every day in the year. Should you wish to experiment with them, plant bulbs 4 in. deep, and cover with at least 6 in. of straw or lawn mowings, keeping the soil moist by sprinkling.

It is important to plant nearly all bulbs, especially narcissi and lilies, as soon as they can be obtained, excepting, perhaps, iris and gladioli, which can be planted at different times to secure a succession of blooms. No fertilisers except bone meal should be used, ammonia in any form being injurious to them.

Narcissi, Chinese lilies, and Roman hyacinths, if planted early, and kept moist will bloom, closely followed by Allium Neopolitanum, scillas, and, if we have a shady spot, a few snowdrops, winter aconits and crocuses, which, however, do not succeed well. Freesias, sparaxis, especially the scarlet dwarf forms and many of the beautiful race of old-fashioned daffodils, will constitute a most attractive feature in our gardens, followed by early gladioli, especially the pure white Bride.

The calochorti or butterfly tulips should not be neglected. Iris Hispanica and Iris Anglica come into flower, and we have reserved some gladioli for late planting, which will keep the garden attractive. The beautiful family of montbretias, of which we have many new and improved types, and the numerous varieties of zephyranthes, will still keep up this floral procession. Last of all will be the late planted montbretias, antholyza, and a few late gladioli, and the yellow sternbergias and colchicums will bridge over the season.

We should include in our garden a few clumps of amaryllis. An effective bed can be planted of Iris Hispanica and Iris Anglica, alternately mixed with the early white gladioli, and a few montbretias. This can be planted with pansies in the winter and portulacca in the summer.

Another beautiful combination would be a bed of late gladioli and montbretias, with an edging of zephyranthes and the little yellow Sternbergia lutea, which would give us a lovely combination of flowers at a time when they are scarce. A good selection of daffodils and narcissi would afford us these old-fashioned flowers for four months in the spring. Emperor and Empress are with me the best late paper white narcissi, and N. princeps the best early variety. They are especially suited for a somewhat shaded location. I have not succeeded well with lilies, with the exception of the common white, as owing to a very common disease they are somewhat uncertain. They rarely give satisfaction the first year, and are probably better grown in pots or in a lath house than in the open.

Though not strictly bulbs, our garden should include a bed of the agapanthus or blue African lily, mixed with hemerocallis or the day lily, with a few Japanese iris. This bed should be a little below the level of the paths, as it must be kept moist during summer. My experience has been in clay. Other treatment may be required in lighter soils.

A considerable outlay will be necessary if we went enough bulbs for a start, but if we are prepared to wait, iris and gladioli multiply very fast, and are best taken up each year, divided, and replanted.

PLANT FAMILIES.

By L. A. G.

The delighted plant lover, entranced by the rich color, grace, delicacy, and fragrance of this plant or the majestic grandeur of another may well feel that—for the moment at least—his cup of joy is full, but if he is so fortunate as to be in the way of acquiring a systematic knowledge of plants, an ever deepening interest is added to his pleasure. Systematic knowledge is to be understood as relating to position in the vegetable world, or scientific classification. The "Natural System" which has universally superseded the arrangement of Linnæus, aims in general terms to bring together plants having the greatest number of resemblances. Viewed in this light, botanical names become fraught with meaning—with an intelligence that constantly expands while gaining in precision in proportion to the advance in experience; a panorama is presented to the mind the details of which continually increase in interest and vividness.

Unsuspected resemblances between plants are often hidden by wide differences in their general appearance, and from this follow the many curious surprises to be found by glancing at a list of the genera of any one family. Let us then take, at haphazard, a few of the common plants of garden or field and see what they will tell us of relatives seldom considered as such except by specialists.

Sitting in placid reflection upon your rose-embowered verandah, the sky-line is broken by the sombre spires of the blue gums, bowing in majestic grace and haughty recognition to the gentle orange-scented breeze, as you gaze in contented mood, perhaps you would be startled into a belligerent denial if told that those trees, towering more than a hundred feet above the classic myrtle beside the house, were of the myrtle family. Yet such is the case. In this instance, the features common to both plants are not easily recognised. They could be quickly determined by checking with the description limiting the family. The true myrtle referred to is not to be confused with the periwinkle, a creeping vine sometimes wrongly called "myrtle," but really a dogbane.

The claim is made that Eucalyptus amygdalina is the tallest tree in the world. Eucalyptus giganteus is apparently not to be sneezed at. It is reported to attain 400 feet in height and 100 feet in girth. (Ketchum, Bot. for Academies and Colleges, p. 100, as to E. giganteus.) The pomegranate, formerly placed in the myrtle family, is now classed with the crepe myrtle in the Loesestrife family. Other plants of this family are the rose apple, the guavas, the bottle brushes, and the Brazil nut tree (Bertholletia excelsa). What we know as the Brazil nut is the seed, of which 18 to 24 are inclosed in a round shell opening by a pore at the top; the shell is half an inch thick and so hard than an axe is required to break it.

An amazing range is found in the limitations of families from the Hornworts, comprising one genus of only one species, to the Daisy or Sunflower family embracing, approximately, 766 genera and 9,800 species. So large a group of plants admits of wide variation in appearance, and it is hardly to be expected that the common and detested cocklebur should be recognised as allied to the daisies and sunflowers. Indeed, some recent authors have cut this genus—Xanthium—and near genera out of that order, making the Ragweed family.

Any one who has come in extensive contact with the tall nettle (Urticus holosericeus), often so abundant about streams and wet places, will freely admit that the family is much too well represented. But the delicious fig and the elm, mulberry, hop, &c., are all of the Nettle family, as also the little known Celtis, nettle tree, hackberry, or sugar berry. By-the-way, if you think you have never seen the fig-tree in blossom, the explanation lies in the fact that the fig is outside in. The flowers are inside the fruit, but they are only technically flowers, not much to look at, but good to eat. The handsome rubber tree is a fig tree, and the young figs are not difficult to find, but they do not seem to mature.

Perhaps it is not generally known that the so-called pepper tree is akin to the poison oak (Rhus diversiloba), both of the Sumac family. The resemblance is easily seen upon examination of the flowers, nor is it difficult to trace a likeness in the fruit, if the strucure is considered rather than the color. The leaves of the pepper tree contain an abundance of a highly volatile oil, and it is said that if a fresh leaflet is cut into tiny pieces and dropped into a tumblerful of hot water, the pieces will be propelled in sudden, jerky jumps, and when the tumbler was brimful a piece has been known to even jump out of the glass. I have never seen an explanation of the faculty this tree seems to possess of keeping its leaves fresh and green in the dustiest places. Perhaps the volatising of the oil prevents the dust from settling on it. The juice of some species of Rhus is said to make excellent indelible marking ink, and it seems not unlikely that the common laurel-leaved sumac would answer well to experiments in that direction. The flowers of the commonest sumac are used to dye carpet rags, &c. It will be remembered that the smoke tree or Venetian sumac is Rhus cotinus, while R. aromatica yields the antispasmodic of that name. We have here a closely related species of R. trilobata with which the Indians made some of their finest baskets. Some of the foreign members of the Sumac family yield the celebrated lacquer varnish of Japan, the mango, the delicately flavored pistachio nut, and the cashew nut, which is borne at the apex of a pear-like disc or torus. The torus is edible, and so is the kernel of the nut-like fruit, but the coats covering the kernel contain a poison so caustic that it blisters the skin.

That wheat, corn, oats, barley, rice, &c., are grasses as much as the blue grass of the lawn is a matter of general information perhaps too common to mention, but it may occasion some surprise to find the bamboos close to blue grass, and closer to fescue grass. Bambusa guada attains a height of sixty to a hundred feet and the spaces between the joints are filled with pure cool water. A few clumps of this grass would make a pretty good water system for a small family.

THE PANSY AND ITS CULTIVATION ON THE PLAINS.

By J. Beggs.

It is said most people are mad on a certain subject—as a rule it is money. Now, with me, next to getting the money, I am a little bit gone on the Pansy, and, as one Pansy grower wrote, it was his first love in flowers, so it is mine. It is very seldom that I meet a person who does not like the Pansy, and I think there must be some affinity between it and children, who will go over your flower-beds, passing more rare plants, to pull up the Pansy. It is very interesting to see the plants in full bloom, the flowers facing you, which puts one in mind of little dogs and cats sitting on their haunches learning their lessons. Pansies are so easy to grow from seed that any person with a small plot of ground can have abundance of flowers for several months in the year. The most that is required is to give them plenty of water during dry weather, and a good mulch of manure, keeping the dead flowers picked off, and, as they begin to get shabby, cut back, when another flowering will result. Although I make it appear such an easy matter to grow Pansies—and I admit any schoolboy can grow his Pansy plant, getting satisfaction out of it too—yet there is a wide difference in growing simply as a flower and the cultivation fit for exhibition. Therefore, this paper is more for those who, like the writer, take an interest in the exhibition table. Coming then to the

POSITION.

This should be in an open aspect, clear of trees, and for early flowering ground sloping north is best; for later flowering, ground facing south, with a breakwind to the north, will do. But I find the Pansy comes on earlier north of Adelaide, as the subsoil is composed of limestone, inducing good drainage, which makes the ground warmer.

MAKING THE BEDS.

These should be about 8 feet wide, with alleys 18 inches between. January is the most suitable time for making them.

SOIL.

Suppose there is not good soil to start with, then take out to the depth of 18 inches (not less than 15), loosen up the bottom, after which put in some ordinary rough loam and manure to the depth of 6 inches filling the remaining foot with virgin soil if it can be had, inclined to be a little stiff, mixed with a third cow and horse manure, equal parts, and to be well rotted, the whole to be turned over several times before planting, without mixing the bottom 6 inches.

PROPAGATION.

There are two ways of doing this—one by sowing seed, the other by cuttings. The first should be put in about the middle of February, making fortnightly sowings up to the end of March, or even later. These sowings are sometimes the best, especially if there has been a long and dry summer. Shallow boxes 5 inches deep are suitable, and for general seed-sowing I find galvanised iron cases answer well raised 18 inches off the ground. Drain by putting a piece of bag in bottom of box, which should have holes bored in it. Fill in with sandy loam up to 1½ inches of top; over this make the soil much lighter. The whole, when pressed down and watered, to be a quarter of an inch below top of box. Sow seeds half an inch or more apart; if they are sown too thickly they will most likely damp. Cover over to the depth of an eighth of an inch, moisten, then put in shady place; cover with glass slightly darkened, and in from 10 to 14 days the plantlets will appear, when gradually remove the glass. Do not keep them too wet. In about five weeks the plants will be ready to handle, when they may be pricked off 3 to 4 inches apart into shallow cases, using soil much heavier than for seeds, and keep them from strong sunshine. For cuttings, young offshoots are most suitable when they are about 2 to 3 inches long, with the heel attached, which does not require trimming, putting them into very sandy soil, pressing about bottom of cutting firmly. Keep in shady place. If the plants are allowed to flower much before taking cuttings their constitution is weakened. The best time to strike cuttings is from March till November, and to preserve all plants struck up to this time during the hot months shading is necessary on hot days, with a mulch of manure also. Do not let them want for water, or flower if cuttings are wanted in March.

PLANTING OUT.

As a rule I do the first planting from the 25th of April to the 5th of May. The rows should be 9 inches apart, and the plants 9 inches in the row. After planting give a good watering, and keep free from weeds. This can be done by constantly moving the soil in dry weather, which I consider is one of the most important parts in the cultivation of plants, and one that has often been urged upon farmers and others. It tends to keep the ground cool in summer and warmer in winter, besides clearing the land of weeds. Too many shoots should not be allowed to grow on a plant; five are plenty, and the flowers will be finer in consequence; also keep the plants from flowering till within a fortnight of a show taking place.

WATERING, MANURING, AND SHADING.

When the warm weather comes on a good watering once a week is beneficial, until the flowers which are intended for exhibition begin to expand. Give about the same time a good mulch of rotten horse manure. Stimulants can also be applied in the form of liquids or in a dry state. For a liquid, cow manure is safest and good, making it like weak coffee, applying once or twice a week. Other manures can be used in a dry state, such as blood, fowls', soot, and Peruvian guano, but very sparingly. They should not be put too close to the plants, afterwards stirring the soil or mulch; at the same time give a good watering. Quantities must be left to the cultivator, who ought to know whether his soil requires little or much artificial manuring, though, I think, if the soil is made well in the first place, and a good mulch later on, it is all that is required to have healthy plants. Shading is sometimes wanted to make the flowers come to time. This can be done by partially covering the plant with pieces of cardboard, so as to prevent the sun striking down on the flowers. It is also a good plan to put some grass clippings under the plants to keep the flowers clean.

FERTILISING.

The time to do this is from August to September, choosing nice weather. It is very simple, merely taking off the bottom petal of the flower you intend to work from and placing it over the lower petal of the parent, then under the stigma you will find plenty of pollen at base of petal, which can be worked on the stigma by friction. Study the quality you are working for, whether it be substance, shape, smoothness, or size. Take flowers of as near the same age as possible, and when done mark the flowers by tying a piece of raffia round the stem; also take care the pods do not get too brown, or they will burst, and the seeds will be lost.

DISEASES AND INSECT PESTS.

The Pansy is very often attacked with mildew. The best remedy is dusting with sulphur before the dew is off the plants. Red spider appears during dry weather. Sulphur will kill these. And at the same time keep the ground and plants moist by syringing overhead. Green fly gets into the points of shoots and disfigures the buds. Spraying with kerosene emulsion will kill them before the plants come into flower. Sparrows do a lot of damage to the young buds and shoots by eating them. A good preventive is to stretch black cotton across the beds at intervals of two feet and one foot from the ground, but I find it rather awkward getting about.

STAGING FOR EXHIBITION.

A good exhibitor will always stage his flowers or plants to the best advantage, knowing that good setting up is a point with the judges. Now, at our shows I do not think the cut flowers are shown as well as they might be, for instead of having a flat box they would be better in an inclined one, so as to be able to see the flowers without so much leaning over. Again, flowers would look better set up in their own foliage instead of the white formal collars now used. If we are to continue the collars, the best adapted for Pansies are two inches for shows and three inches for fancies, of a circular form, having a key-shaped hole in centre a quarter of an inch over, the let-in to be a half-inch long by an eighth wide.

POINTS.

Last, but not least, are the points of a Pansy, and on this subject I am inclined to believe some good may come, if there were rules prepared for our schools showing the standard points of animals, poultry, flowers, and fruit, to be taught to the higher classes before leaving school, who would thereby have a knowledge in after life how to choose the best. It is often remarked, "what a beautiful flower," simply because it is large. This is a mistaken idea, as all points cover size in a Pansy and in other florist flowers. In passing, I know practical gardeners who argue there is no difference between a show and a fancy Pansy, yet they will allow it in the Pelargonium, Dahlia, and others, all of which were classed by the florists. There are three classes in show Pansies, viz., white grounds, yellow grounds, and selfs. The selfs comprise dark, white, and yellow. These should have a dense blotch on the lower petal, either small or large, and just showing in the two upper ones; it must be well defined, without runnings. In white or yellow grounds the color of belting must be the same on all the petals. This applies to the ground colors also, which can have a wide or narrow field, but not to have irregularities or flushings, to be of a circular form, and the blotch to be darker than the belting.

Fancy Pansies have a blotch nearly covering the lower petals and two upper ones.

The selfs are the same as the shows, except this difference; then come white, yellow, and other bands on the lower petals, with blue, purple, ruby, plum, and various colors on the top petals, laced and other sorts.

In Pansies the flowers should be of a leather-like texture, circular in form, quite smooth, eye well defined, blotch to be dense, colors clear and regular, and to be large, not less than an inch and a-half for shows, and two inches for fancies.

I have not dealt with the potting of Pansies, as I have had very little practice in this part; nor have mentioned violas, but their cultivation is very similar to the Pansy.

VIOLETS, AND VIOLET CULTURE.

By E. R. M.

The sweetest flower that grows, its delicate perfume and soft shades loved by all. There are those who express a preference for either the carnation or the rose when offered their choice, but when a bunch of perfect Violets is offered them the softer, loving feeling of man, or child, is instantly appealed to.

Look over the gardens, large or small, in the home of the rich man or of the poor, and the Violet will be found, and yet this flower so generally loved and usually carefully cultivated, is so little understood that failures in its cultivation are more often met with than success.

"My Violets grow well, but do not bloom," is the usual complaint. "Where have you planted them?" "On the north side of the house, of course—so they may be well shaded." Quite right for summer growth, but quite wrong for winter bloom. The Violet loves a medium, shady spot during the hot weather, but an open space in winter and spring, when the blossoms come.

If you have a space six or eight feet, north or east of a fence or hedge row, plant out a row or two of Violets—this will give a happy medium of light and shade. The soil—any good sandy loam; in fact, any soil if well mulched with old manure or straw.

Never expect good results from outside runner plants. In taking up a bunch of old plants, select only the inner and stronger plants, discarding all the outer and smaller ones.

Plant one foot apart in the row, be careful not to cover crown, either when planting or in after cultivation; do not hoe deeply near the plant, as the Violet feeds close to the surface.

During the summer months water about once a week if soil is loamy and well mulched, otherwise two or three times will be required.

As to varieties—in the double varieties—Marie Louise is the standard double blue, not so large as Farquahar, but more satisfactory for garden culture.

Swanley White is the most perfect, free-blooming, double white.

Single varieties are very numerous, but only a few are adapted to our garden culture.

The old Czar or Russian Violet for the sweet darker one. California for a good all-round purpose sort—hardy—free blooming and generally satisfactory; was the largest of the long stemmed varieties until the superb "Princess of Wales" was introduced five years ago; it is often called the pansy formed Violet; long-stemmed, large, open, and very fragrant blossoms; leaves very large and soft. This is the standard cut flower Violet.

Violets respond to fertilization. I use a special mixture of commercial fertiliser with most satisfactory results—and was able to pick bunches of "Princess of Wales."

Violet diseases and enemies are: Leaf spot, the great Violet disease; it can be checked by spraying with Paris Green or Bordeaux mixture. This remedy if applied several times during the season will also kill snails and slugs which are so fond of leaf and flower.

The shell snail is becoming a garden pest. Go out early in the morning when they are upon the leaves, pick up snails and put in salt water; this quickly destroys them, as neither snail or slug can stand salt. Old, rusty and diseased foliage should be cut off, giving flower buds an opportunity to form and the plants a chance to make a vigorous new leaf growth.

GROWING ROSES IN SOUTHERN CALIFORNIA.

By L. H. Bailey.

In many localities in Southern California the Queen of Flowers attains a perfection probably found nowhere else. That this perfection is not general is partially owing to adverse conditions, such as great range of temperature during each twenty-four hours, heavy fogs at critical periods, &c., but as a rule failure in whole or part is due to the lack of intelligent treatment. The chief obstacle to successful culture is the attempt to produce blooms every day of the year. Though quite an impossibility with any rose, the evil is still persisted in by 99 in every hundred possessors of a garden. While Roses are grown in great profusion in Los Angelos, few, if any, do as well here as in Pasadena, which, though but nine miles distant, has the advantage of being several hundred feet higher than Los Angelos, and, therefore, less subject to fog or great range in daily temperature. In some places a certain few Roses will produce an astonishingly fine crop of bloom, when but a mile or two distant, with no change of soil, and very slight difference in altitude, they will be utterly worthless; though a like number of other varieties will give as good returns as those first mentioned. Consequently the common enquiry at a nursery as to "What are the best dozen Roses I can grow?" is usually met by the equally pertinent query, "In what part of the city do you live?"

Many Roses do fairly well everywhere, and among these, Duchesse de Brabant more nearly produces a continuous crop of blossoms than any other. For this reason it stands in a class by itself, and is not considered in the appended list of the best dozen Roses for Southern California; though every one should grow at least one bush of this variety. Along with the Duchesse might well be placed the Polyantha, Madame Cecil Brunner; and the climbers, Cherokee, Banksia, Ophire (or Gold of Ophir), Beauty of Glazenwood or Fortune's Double Yellow. All these produce most wonderful crops, but none more so that the last mentioned, which, in favored regions produces a wealth of flowers simply dazzling to behold.

All the Roses named thus far are worthy of a place in any garden. One of the chief causes of failure by the average amateur is the lack of an intelligent knowledge of the plant's first requirement — recurring periods of absolute rest. The necessary resting periods are best obtained by withholding the water supply. Most amateurs, and a majority of self-styled "gardeners," persist, against all rules of common sense, in planting Roses either in the lawn or in mixed borders with other plants. In either case all but the Roses require a constant watering. Having planted in this fashion, the grower has cast away all chances of first-class results. Rose beds should never be made a feature in landscape gardening, as the plants when dormant and judiciously pruned are unsightly objects at best. The most obscure spot obtainable with the proper exposure is the place to grow flowers. To obtain the best results the Rose requires the same amount of rest here that it obtains where the winter season leaves the grower no alternative.

Our dry summer air is a serious drawback to the growth of many Roses, there being few places where Moss Roses thrive, and these must be grown in whole or partial shade. Niphetos and Marechal Niel are good examples of Roses requiring partial shade if good results are desired. Many localities cannot grow the two last mentioned, or such as Perle des Jardins, Meteor, Catherine Mermet, Francisco Kruger, Reine Marie, Henriette and many others, on account of mildew. Even among varieties whose buds are immune, it is often impossible to get foliage unaffected. Injudicious watering is more largely to blame for these unfavorable conditions than any other agency. Laurette is a Rose which often produces the only perfect flowers to be found among a hundred varieties, and this is particularly the case in places visited by heavy frosts. Laurette seemingly goes unscathed, while all others are more or less blasted. The great Rose of the Eastern United States, American Beauty, is almost a complete failure here, and is not worth growing except in a very few well-favored gardens, and even there is far from being perfect.

Roses are usually propagated from hardwood cuttings, grown out of doors, and December is the best month, though the writer has successfully rooted them from October to March, according to the variety.

La France for many years was the leading Rose in California, but is now rapidly becoming a thing of the past, though it can never be entirely banished, for it is still, in a few gardens, the queen of the family. Its involuntary retirement from our gardens is due entirely to a "die back" (anthracnose), which affects many other plants than the Rose, but seems to have a special liking for La France. Thus far no cure has been found.

Below will be found a list of the best dozen bush, and half dozen climbing Roses for Southern California, compiled from lists furnished the writer by the six best nurserymen and growers in Los Angelos. An increasing demand for Maman Cochet is quite marked, and the few White Maman Cochet, yet grown here seems to mark it as the coming white Rose for this section.

Among the climbers, the same may prove true of the Climbing Kaiserin Augusta Victoria, which bids fair to become as popular as the bush Rose of the same name.

The following lists place the varieties in the order of their desirability for either florist or fancier, when grown out of doors —Bush Roses: Marie Van Houtte, Madame Lambard, Maman Cochet, Papa Gontier, Kaiserin Augusta Victoria, Laurette, The Bride, Catherine Mermet, Meteor, Perle des Jardins, Caroline Testout, Eliza Suavage. Climbers: Lamarque, Marechal Niel, Climbing Souvenir de Wooton, Reve d'Or, Reine Marie Henriette, Gloire de Dijon.

This list will be found the best for Los Angelos and vicinity generally; the intelligent nurseryman or the purchaser (if a student of the Rose) should be able to make the slight changes rendered necessary by peculiar local conditions.—Ernest Braunton.

The above article fails to state the best time of the year in which to rest the plants. I have a plat twelve feet by ninety feet, away from any other vegetation, Roses being the only crop. Though planted out but one year, the water supply was cut off June 20, and they will receive no more until November 1. Young as they are, not one plant yet shows the need of moisture. These bushes will be pruned heavily about October 15, cutting out all wood smaller than a lead pencil and cutting back three-quarters of the large wood. Owing to the small amount of wood left, the bushes will, in from ten to fifteen days, start to leaf out, and as soon as the first leaf unfolds they should be well irrigated, this to be followed by another one a week later, and so on to the end of the blooming season. The same treatment should be accorded the climbing Roses, though, of course, they must not be pruned down to the same height as the bush varieties; still, unless the growth is needed to cover an arbor or some unsightly object, the climbers should be pruned more severely, in proportion to their size.

DISBUDDING CLIMBING PLANTS.

Do we pay as much attention to this matter as it deserves? I think not. While the summer shoots are growing we are generally engrossed in other work. But if a few hours were devoted to the pinching out of superfluous growths of Roses, Honeysuckles, Jasminums, Azaras, Escallonias, and similar plants, better results would follow than if winter pruning were depended upon solely.

No matter how well the plants are thinned out and cut back in winter and spring, there are many shoots which possess more buds—which grow eventually—than there is space for their proper accommodation. The result is a very untidy tangle. Giant effort is made to train the climbers and make them look well cared for, but the success is not an unqualified one.

We prune a vine and a peach, but the rods and trees have to undergo a process of pinching which gives a better shape, prevents undue crowding, and enables a full crop of luscious fruit to ripen. Climbing plants so treated make stronger shoots and develop finer blossoms than they could possibly do if neglected as regards pinching. The weakest shoots are the right ones to remove—those which do not bear flowers, but, if left, will cause overcrowding and prevent those which are strong from maturing. Where there are plenty of robust shoots, they should be laid in position while quite young, as, if left till they are hard and stiff, it will be a difficult matter to fix them just where they are wanted.

Most of the rapid growing climbers, such as Honeysuckles, Roses, and Jasminums, soon become bare at the base unless properly trained; and the disbudding of branches nearer the top of the plant will induce others to grow, and that more strongly at the base. When dealing with young plants we generally fasten every new shoot to the wall or fence. If the growths are few in number this practice is quite right, but not so where many shoots appear —a little disbudding will help to lay a proper foundation. G. R. KNURR.

S.A. Horticultural & Floricultural Society.

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The Orchard.

OPERATIONS FOR OCTOBER.

By W. J. Allen.

All pruning, and most of the winter spraying of deciduous trees, should be completed. It must be borne in mind that trees must not be sprayed with the lime, sulphur, and salt solution after they are out in leaf or bloom, as this spray is very severe on any foliage, and should never be used except during the winter and before the buds burst in the spring. This spray helps to keep in check the various scales which attack deciduous trees, particularly the San Jose scale, and also keeps the trunks and branches of the trees free from moss and lichens.

Under no circumstances should trees be sprayed with any solution while they are in bloom, else considerable damage may be done, but they may be sprayed a week or ten days before they come into bloom, and again as soon as the fruit is well set.

The early part of this month is a good time to apply commercial fertilisers.

It is well to complete the ploughing of all orchards as early as possible, especially where green manures have been grown, in order that the latter may rot before the dry weather sets in. This, of course, is of more importance in the interior than on the coast, where there are usually good rains from time to time throughout the summer. In the latter case, however, it is rather risky to postpone the ploughing too late, as occasionally the rain fails us; and should there happen to be a crop of tares or weeds growing among the trees the ground soon becomes hard and dry, and it will not be long before the trees begin to wilt. It is well, therefore, to keep the work up to time, so that should the season turn out a dry one you are not caught napping.

The spring planting of citrus fruits may be proceeded with as early as possible this month. Whenever possible, choose cloudy or cool weather, and observe every precaution to keep the roots from becoming exposed to the wind or sun, as there are more trees lost by careless handling at time of planting than from any other cause.

Trees will commence to grow this month, and towards the latter end it may be found advisable to go over them and rub off all the young growth which is not needed to make the crown of the tree, leaving buds starting from different points around the barrel of the tree where it is desired that the limbs should start from, which are to form the crown. Never allow two to start from the same place, keeping them at least 4 in. apart, radiating around the tree.

Citrus trees may be pruned this month. Grafting of nursery stock trees and vines may be carried out this month. Vines are best grafted just as the buds are about to burst, and after the grafting of deciduous trees has been completed.

WALNUTS.

The Mandshurian walnut (Juglans mandshurica) is a native of America, and is one of the hardiest of the family. In districts too cold for the common walnut this species is recommended. It has foliage of unusually large size, and is a very ornamental tree. The leaves are 3 ft. in length, and the leaflets measure 7 in. in length by 3 in. in width. The nuts are inferior to the common walnut, but they ripen earlier, and from six to thirteen are borne in a cluster. They are eight-angled, and deeply pitted. It would probably resist our hot Australian summers much better than the common walnut.

The black walnut (Juglans nigra) is one of the noblest and most useful trees we have. It will thrive in almost any kind of soil, is of quick growth, and when planted thickly makes fine straight timber. When planted singly or in very exposed situations, the wind frequently breaks the branches. It will grow to a height of 100 ft., and sometimes with a straight trunk without a branch for 65 ft. From 10 ft. to 12 ft. is not an uncommon circumference for the black walnut stem. It has been stated that grass will not grow underneath this tree, but such a statement is erroneous. It produces its nuts in clusters of from two fruits to five and six togeteher. It would likely pay to grow the black walnut from a commercial point of view, for its timber alone; its nuts are of no value.

A Japanese walnut named J. cordiformis is stated to be a very handsome tree. It has very large leaves, which carry about fifteen oblong leaflets, and these are covered on the lower side with a rusty-colored down. It flowers very freely; its nuts have a singular appearance, they are flattened, tapered at one end, and somewhat cordate at the best. Its grand foliage, long male catkins, and striking racemose clusters of fruits will render it a great acquisition.

The American "butter-nut" (J. cinerea) is a beautiful and vigorous-growing tree, a native of the North American woods, where it attains a height of 100 ft., with a trunk 2 ft. to 3 ft. in diameter. The leaf-stalks and young wood are covered with brownish down, especially underneath. Each fruit is over 2 in. long when fully grown. The kernel is very full of oil, and soon becomes rancid.

Juglans Californica grows wild on the coast region of California. It is sometimes found in a shrubby state, but generally in specimens 40 ft. to 60 ft. high. Its value as a species for cultivation is not pronounced. It is in cultivation in England. Its nuts are very slightly furrowed.

The most distinct of all walnuts is J. rupestris. It is of dwarf, shrubby habit, and has small, finely-cut leaves, which are from 6 in. to 8 in. long, and these consist of as many as 11½ pairs of leaflets, these being narrow-lanceolate, toothed, and 1½ in. to 3 in. long. The nuts are spherical, and about ¾ in. in diameter.

Of the common walnut (J. regia) there are several varieties which come into bearing earlier and are of dwarfer habit than the species. The "Dwarf Prolific," "Preparturiens," and "La Fertile" are the more common kinds. A most noteworthy kind is the fern-leaved variety, generally known as laciniata, but also known as filicifolia and heterophylla. A curious variety named monophylla has the leaflets reduced to one very large one and a pair of small ones, and sometimes even the latter are absent. Of twice the size of those of the ordinary kind are the nuts of a variety named maxima; its leaves are very large and striking. The common walnut is a native of the region between the Caucasian and Himalayan Mountains, and has been cultivated in Britain for many centuries, probably from the time of the Romans.

When possible walnuts should be raised from seed, and placed in the positions where they are to remain as soon as possible. The nuts should not be allowed to get dry before sowing; it is better to stratify them in sand during the autumn, and sow in early spring. Sometimes the young growths are nipped by frost, and this causes the trees to become bushy; it is therefore necessary to train up the main shoot by means of a stake for a year or two. The walnut thrives in many parts of Victoria, but it is a pretty gross feeder, and thrives best in a rich, moist soil. Of late the trees have been attacked by a disease, which is being investigated by Mr. McAlpine, the vegetable pathologist.

The cultivation of walnuts in some parts of America is making great progress. At one place, Pasadena, on the sewage farm, which is owned and managed by the corporation of that city, there are 135 acres of walnut trees, about half of which have commenced to bear; the yield last year was 52,432 lb., which yielded a revenue of 3,250 dollars. But here also they are having trouble with their walnuts, a disease known as bacteriosis attacking the twigs and fruit. It appears in black, sunken spots on the hulls of the nuts, spreads, and reduces the whole to a black rotten mass. Whole orchards are suffering, and have to be sprayed with Bordeaux mixture.

Although the cultivation of the walnut in California has during recent years made great strides, there seems to be no fear of over-production. The trees are planted 40 ft. apart, or 27 to the acre, and each tree will bear yearly from 30,000 to 75,000 nuts. The trunks of the large trees are 25 ft. in circumference. The trees commence to bear at the eighth year from the planting of the seed. In England and in Europe generally it takes nearly three times as long before the trees fruit. In Victoria the common walnut bears nearly as quickly as it does in California. Walnuts are one of the most tasty and nutritious of nuts. The only fault that can be found with them indeed is that they are so seductive that you do not know when to leave off eating them. Melbourne is largely supplied with green walnuts from Tasmania and with dried ones from Europe, but there seems to be no reason why we cannot grow sufficient for our own consumption.

SOAP FOR BLACK APHIS.

A spray of one cake of Sunlight soap dissolved in 2 gallons water is a very effective spray for black aphis, and can be applied at almost any time without fear of injury to the tree.

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QUALITY IN FRUIT.

By C. Bogue Luffmann.

The smallness of local and adjacent populations, the remoteness and expense of packing, and transit to foreign markets, combined with the comparatively high price of labor and material, compel the Victorian fruit-grower to work for a high standard of excellence in all he cultivates. In spite of the efforts of horticultural and fruit-growing associations and exhibitions very little is known regarding the making of quality. Standards are impossible when no comparison can be made; hence, few realise how inferior is their fruit in size, color, flavor, and keeping qualities. Here and there excellent samples are regularly produced, but the vast bulk is wofully below the standard which can command a ready sale at a paying price. The common causes of inferiority are not a few, but as regards flavor it is largely due to the trees being placed in impossible soils and climates. Climate plays a much more important part in this matter than the soil ingredients of themselves. The dryness of the atmosphere whilst the majority of our fruits are developing and ripening acts seriously against their perfect maturation. A dry air is particularly objectionable to apples, pears, plums, cherries, and all the bush fruits. Peaches can do in a somewhat dry atmosphere, but where it becomes really dry and remains so for weeks or months, no fruit of fine flavor will be produced. Apricots, figs, and the grape in all its forms will attain to good size and quality in the driest districts, providing the moisture of spring and early summer is equal to swelling them to a good size; but, as a general rule, full and distinctive flavors come out in greatest perfection where the atmosphere is moist rather than dry. In a casual way all observe the difference of the temperature of the soil and the air during the various periods of summer. The skilful cultivator will do all he can to balance these in accord with the nature and needs of his subjects. Those who have eaten fruit grown under glass are aware of the exquisite flavor of every particle of flesh within the skin. This is due, not so much to the preparation of the soil and limitation of the root range, as to the roots and leaves being entirely under the control of the gardener, who gives or denies air of varying temperatures and degrees of moisture. He also provides screens from the hot sun, excludes hardening, drying, and chilly winds, and all such elements and enemies as work injury to leaves and fruit. He also takes off leaves or encourages more, so as to regulate the volume and quality of the sap. In brief, everything that would coarsen and make irregular is shut out, and everything that will ensure the perfection of size, color, form, substance, and flavor are systematically striven for. Our open-air conditions offer the widest contrasts to those obtaining in the orchard-house, but we should not lose sight of the object-lesson provided.

For yielding fruit of high quality, next to glasshouses come walls, then terraces or rocky hillsides, since both of them afford the chance to control the water supply and provide moist or dry air for the leaves and fruit. We are well-nigh powerless to affect the temperature or degree of moisture of the atmosphere on broad and open areas such as have been most commonly chosen for orchard sites. If our ideals could be realised we should have positions and conditions which would admit of our "turning on" hot or cold, dry or moist air, according as we want leaves and fruit to grow or ripen. In all circumstances we should know the feeding, the growing, and the ripening season for roots, and leaves, and flowers, and fruit, and wood. Few but are familiar with the extraordinary difference in the quality of fruits grown in different climates. The pears of Gippsland are better than those grown in warmer and drier districts. It is not the soil proper, but the difference in its condition, and that of the surrounding atmosphere, which is responsible for its superior quality. Apples in the north, or in any hot and shallow soils, are of inferior quality, chiefly because they do not get sufficient elaborated sap through the agency of one set of leaves, but depend on two or three imperfect growths, none of which mature sufficiently to assist the fruit in its final stages of absorption.

The peach tree will endure a high temperature and some degree of drought, but under such circumstances its fruit will always be inferior. Seldom indeed do we meet with a peach, which, from a European standard, may be judged even second class. Our fruit is under-sized, unequally formed as regards the nature of its flesh throughout. Thus there are green, bitter, and hard parts when the face or upper side is ripe unto decay. This is commonly due to irregular feeding and unnatural heat and dryness of air, forcing maturation in one part before the general body of the fruit has been fully supplied with elaborated sap.

And where fruit ripens evenly fine flavor is usually lacking, as where the roots are sending up an abundance of crude sap (too often little more than water, through the poverty of the soil), a flavorless and sloppy mass is the result. The green, turnipy, and mushy peaches are incapable of bringing a good price.

Early plums are usually without flavor, owing chiefly to their ripening whilst the bulk of the sap is in a crude condition; whilst in hot districts, where the air is dry, plums, coming in at a dry season are usually of low grade as regards quality. Plums, like apples, often lose their first crop of leaves through drought or scorching, and the second growth is so poor as to be quite incapable of nourishing the growing and ripening fruit in the best manner.

It is often stated that local strawberries are not equal in flavor to those grown in the old land, which is quite true, and with good reason. A moist heat is necessary to the development of the strawberry, one or two dry clear days being sufficient to endow it with a fine color, substance, and flavor.

All variations in size, quality, keeping powers and general appearances are, apart from distinctive habits of varieties, the outcome of climate acting on the food supply, the man's attention or neglect at different seasons. Moist air is of the greatest benefit to soft-skinned and sensitive fruit. Moist air should, as far as possible, prevail until the fruit is fully grown. Dry air is needed to ripen a percentage of the leaves, especially those near the fruit, when it is the season for gathering. Fruit taken from trees when all the leaves are green and unfinished, is ever inferior.

A good appearance is, of course, a great aid to the sale of fruit, but fine flavor is, after all, the only thing which will find and secure a permanent market, as it compels those who discover it to become regular purchasers.

Of course, where trees are planted in radically wrong positions, little or no improvement can be hoped for; but a great deal can be done in the way of improved methods of cultivating, soil dressing, and pruning, towards raising the standard of excellence in our fruit. Placed as we are, little and good will prove of greater value than heavy quantities of inferior stuff. The finer the quality the greater the keeping power, hence the marketing season can be prolonged, and gluts to a great extent avoided. Even for preserving, the finest fruit is necessary, as no flavor obtains in such as are made from green or badly nourished samples. Most stone fruits are losing their vitality, and it is high time that some species—especially peaches—were introduced from vital seedling stock, which are best able to bear up against hard natural conditions and the presence of insects and disease.

SPRAYING FOR FUNGUS DISEASES.

Nearly all the preparations so far successfully employed to control the attacks of the fungus enemies of cultivated plants are forms of copper compounds. Sulphate of copper, or bluestone, is generally regarded as the cheapest and most reliable basis for the manufacture of these sprays. Though a simple solution of bluestone has been used for very many years, and is still the favorite preventive for the stinking smut of wheat, yet it was not until 1882 that any great headway was made in treating plant diseases. In that year Millardet, at Bordeaux, in France, found that a compound of bluestone and lime which had been applied to some vines to prevent the fruit being eaten had a most remarkable effect in checking the dreaded mildew.

This compound, now regarded as the best all-round fungicide, received the name of Bordeaux mixture from the place of its origin. Since then various preparations have been brought forward for similar purs poses, and of these there may be mentioned the ammoniacal copper-carbonate, the copper-soda or Burgundy mixture, and copper acetate. Each has special features of value, but none has so far proved as satisfactory for general work as the Bordeaux.

THE COPPER-SODA SPRAY.

This spray is of recent origin, and in it washing soda takes the place of the lime in the Bordeaux. Though on the whole the results obtained from its use in our experiments were hardly as good as with Bordeaux, there seems no reason why this mixture should not prove quite as efficient.

The formula recommended for general use is the 6 9·50, that is, 6 lbs. of bluestone, 9 lbs. of washing soda, and 50 gallons of water. A stronger solution, 6 9 40, is worthy of trial in wet districts. The process of manufacture is exactly the same as in Bordeaux, the bluestone should be dissolved in one barrel and made up to 25 gallons, and the washing soda dissolved in the other and also made up to 25 gallons, the two solutions being then run evenly into a third barrel. Here there is no necessity for a strainer, as the washing soda dissolves completely. The resulting mixture is of a sky-blue color. but more watery In appearance than Bordeaux. It possesses one advantage in that the hands are not appreciably corroded by it, but as against this scarcely any perceptible deposit is seen on the trees after the spray has dried. Hence some substance might be added, so that its presence may be more easily detected, and the quality of the work done by the sprayers more readily determined. To those with a desire to experiment in the improvement of this mixture it may be suggested that any of the following substances may be added to the soda solution before mixing with the bluestone, viz.:—Sal ammoniac, soft soap, molasses, saltpetre, sulphate of ammonia, or salt. Generally speaking, about 1 lb. of any of the salts may be used, and say 2 lbs. when using soft soap or molasses. Perhaps it is hardly necessary to add that such experiments should be conducted on a small scale only, even on single trees, the bulk of the spraying being done with the ordinary copper-soda.

BLUESTONE AND SOFT SOAP.

A simple solution of bluestone, 2 lbs. in 50 gallons of water, with 4 lbs. of soft soap in addition, is a cheap and valuable fungicide for use in comparatively dry districts. Owing, however, to its strongly corrosive nature, it is liable to cause considerable scorching of the leaves if applied after the buds burst, hence it is advised for use only before the blossoming.

WHEN TO SPRAY.

Some orchardists about to give spraying a trial, and who have acquainted themselves with the composition of Bordeaux mixture, fondly imagine that there is some fixed date which is the best time for spraying; but if they considered for a moment what they spray for, then they would see that there is no such thing. The main object of spraying for a disease such as the black spot of the apple is either to prevent the spores of the fungus from germinating, or to nip them in the bud, just as they are putting forth their delicate germ-tubes, and seeking to penetrate the young and growing tissues. The time at which the germination of the spores happens is largely dependent on the nature of the season, which hastens or retards the development of the fungus, just as it does that of the tree itself. Now, if the seasons were perfectly regular, and the development of fruit trees in different localities uniform, it might be possible to give a definite date, but with the varying seasons and conditions, the most that can be done is to indicate the best time for preventing the development of the fungus. It therefore becomes important for the perfect success of our spraying operations, not only that the Bordeaux mixture is properly prepared, and the ingredients in the right proportions, but that it is applied at the best time for reaching the fungus before it has penetrated the tissues and gained a footing inside the plant.

Researches by J. F. Clarke have shown that a germinating spore has a certain solvent action upon dried deposits of copper compounds with which it may be in contact, and in fact the process of germination itself sets free the poison which kills the spore. Thus by spraying too early, when the tree is quite dormant, we are applying the fungicide long before it is wanted, and in addition subjecting it to the influence of rain and other agencies likely to wash it off or destroy its usefulness.

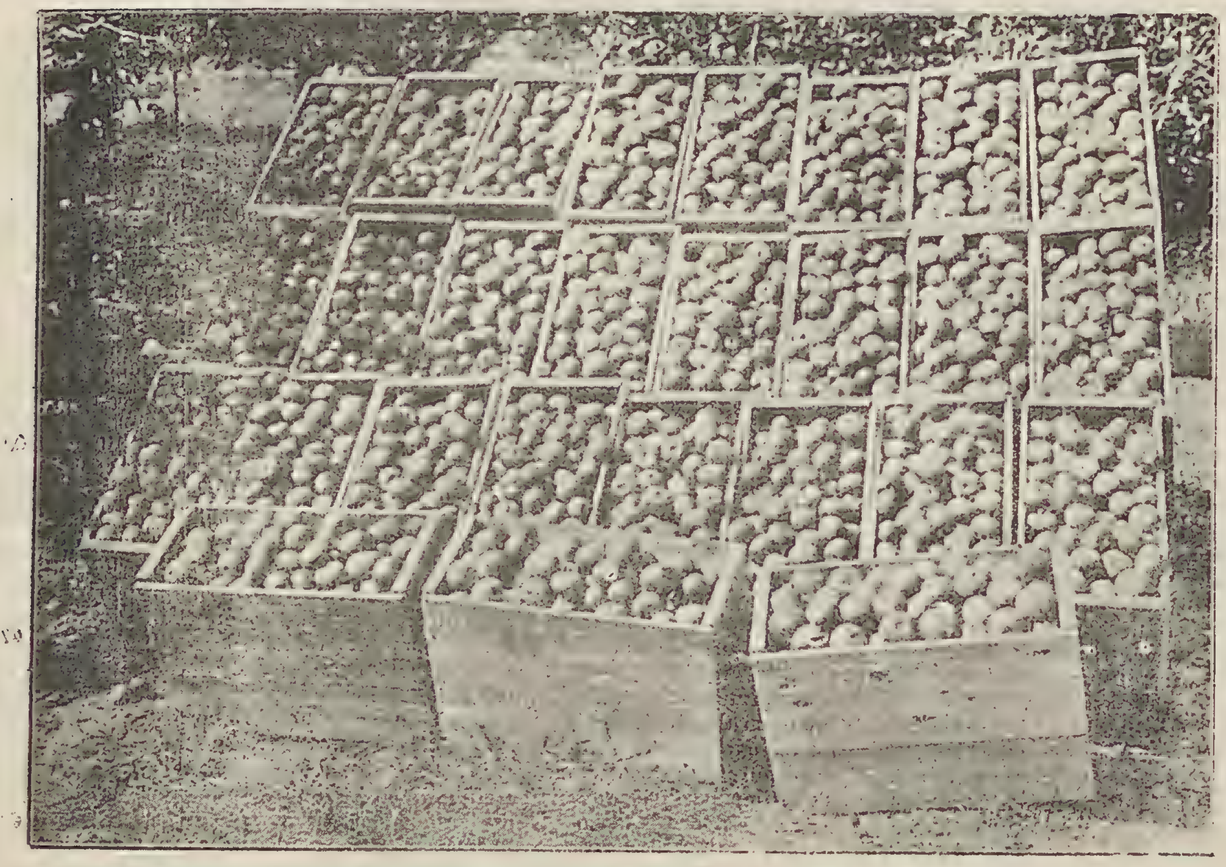
Some observations made during the last two years on the first appearance of the black spot in the spring will be of interest in this connection. At Killara, in 1902, a very late season, some Ribston Pippins were sprayed on 23rd September, when the first buds were bursting, but some time before any blossoms had fully appeared, and when examined on 15th October the petals were more than half fallen, and the fruit mostly set. The black spot was met with on a few leaves enclosing the blossoms.

When spraying at Doncaster, on 2nd October, 1903, when the trees were coming into flower, and about five or six days before full bloom there was abundance of black spot on the young leaves and fruit-stalks. Many clusters of flowers, with not a single blossom expanded, bore a plentiful crop of black spot on the stalks and calyx, hence in this case spraying was done too late to secure the best results.

In 1902 with Bosc pears sprayed on 24th September, some of the mixture was afterwards seen on top of the spot. On 9th October black spot was extremely common on fruits, fruit-stalks, and young leaves, when petals had mostly fallen. On another variety growing alongside, name unknown, the black spot was fairly plentiful on the same, 9th October, though at that time the petals had not quite half fallen, and many flowers were not yet open. Many individual flowers and stalks were plucked, showing the spot before the petals had expanded.

These facts, however, show that the first infections of the young leaves and flower stalks of the pear must have occurred in the case of the Bosc prior to the 21th September, and in the other variety probably a few days later. There seems then no escape from the conclusion that the first spraying of pears must be done as soon as the first blooms begin to expand, and probably if this were followed up by another about ten days later, when the tree would be just about in full bloom, the maximum beneficial results would be obtained. It seems doubtful if the black spot of the pear can be so successfully controlled by

SCARLET NONPAREIL APPLE AT MR. VEAR'S, BURWOOD—27 CASES.
(sprayed twice.)



SCARLET NONPARIEL APPLE AT MR. VEAR'S, BURWOOD—27 CASES.
—Victorian Agricultural Bulletin.

one spraying as is done with apples, but further experiments are needed to settle this point. In any case, as the blossoming of the pear is spread over a lengthy period, usually marked by much rain and heavy dews, conditions extremely favorable to the germination and growth of the spores of the fungus, conditions also tending to wash off the spraying material, the advisability of two applications of Bordeaux, as before suggested, is strongly urged upon growers.

SPRAYING IN BLOOM.

A good deal has been written about spraying fruit trees in bloom of a somewhat contradictory character, and it is advisable therefore to state the experience of the past season. When an apple blossom fully expanded was carefully sprayed with an atomiser, so that every portion received the spray, no fruit set, presumably because the top of the stigma was rendered unfit for the germination of the pollen grain either already upon it or afterwards to be carried there. But when a large tree with the blossoms fully expanded was sprayed with a light and fine spray, then the fruit set very well, and no apparent damage was done. With such a mass of blossom as a healthy tree usually bears, a very fine spray distributed over such an extensive surface is not deposited in large quantity at any particular spot, and the number of stigmas rendered unfit to receive or retain the pollen is very small in comparison with the total number, and so the yield is not apparently affected. While it may be quite safe to spray a fruit tree when in full bloom, provided it is done in the form of a very fine mist, yet when one spraying alone is given it is not altogether advisable to do so for various reasons, unless weather conditions have prevented the operation being performed earlier.

In the first place it is rather late, since we have seen that the black spot may appear even before the flower buds have fully expanded.

In the next place there is such a large and extensive surface to cover that the chances are against its being thorougly done, and it is the unsprayed spots which form breeding grounds for the fungus.

HOW TO SPRAY.

It is well to note that good results can only be insured by the use of properly prepared mixtures applied with good machines. A first-class pump, easily worked and not liable to get out of order, is an absolute essential. With copper-soda or bluestone a very fine nozzle can be employed, as there is no grit to cause stoppages. In using Bordeaux a nozzle easily cleaned is very desirable, thoug thorough straining will be found to greatly reduce the possibility of choking. A fine spray, lightly coating the whole of the tree and particularly the growing shoots and the fruit buds, is what should be aimed at. The tree should not be drenched so that the mixture runs off in quantity, for it is found that in such cases a lesser quantity adheres, and this is why it is sometimes recommended to give two light sprayings at intervals of a few hours.

If the instructions here given regarding the time and method of application are followed it is safe to say that no serious losses are likely to be sustained from the attacks of our more common fungus parasites.—Department of Agriculture Bulletin, Victoria.

The Seedless Apple.—Mr. John F. Spencer writes a letter describing the characteristics of a new seedless apple which he has originated. Relative to the nature of the fruit Mr. Spencer states that there are stamens and pollen as usual, but no flowers or blossoms. The fruit resembles a small berry in shape. "It retains this appearance until half grown, and then assumes the shape and form of the fruit. The fruit loses none of its flavor because it is seedless and coreless. There is nothing but meat to the apple, save the small navel end, which has every appearance of the navel in the orange." Mr. Spencer states that he has been working to produce this seedless apple for the past seven years. He considers it a revolutionary acquisition to the apple industry.

The Development of the Seedless Currant Berry.—Mr. A. J. Perkins writes:—A record is given of some experimental work done to determine whether or not the seedless Zante currant forms fruit without pollination. Preliminary work showed that the pollen from Zante currants, as well as from a number of other varieties of grapes, germinated in sugar solutions. A number of illustrations are given showing the pollen grains and the different forms they assumed in germination. The size of the pollen grains was found to be not more than three or four times the size of ordinary yeast cells. The individual grains are invisible to the naked eye, and cannot be discerned even with the ordinary magnifying glass such as can be used out of doors.

In emasculating the Zante currants it was found that, notwithstanding the great care taken and the fact that the emasculation took place indoors instead of in the field, a few pollen grains regularly adhered to the stigma; and germination experiments showed that these pollen grains were sufficiently ripe to germinate and thus cause fertilisation of the ovules. In normal fertilisation of the currant it was found that the fertilised ovules increased in size for about ten days and then finally aborted.

From the results of the work it is concluded that the pollen of the seedless Zante germinates as freely as that of other seeded varieties; that the pollen is mature; and that it is extremely difficult, if not impossible, to avoid leaving pollen on the stigmas of vines when emasculating them two or three days prior to their expansion. It is, held, therefore, that certain experiments which have been reported heretofore and in which emasculated flowers set fruits, are inconclusive as to the alleged absence of fertilisation in the development of seedless fruit. Nothing in this experiment was discovered which would justify the assumption that fruit is produced in tha ovule of the Zante currant without the intervention of pollen.

On the Duration and Variations in Grafted Vines.—Monsieur L. Degruly writes a controversial article in which he points out that the variations in characteristicc of vines due to grafting are not sufficient on the whole to cause vineyardists any apprehension. The thousands of acres of French vineyards which have been reconstructed on American stocks still continue in a thriving condition and produce an abundance of wine 20, 25, and 30 years after grafting. The subject of variations brought about as a result of grafting is wholly in an experimental stage, and as yet is of scientific interest only.

Notes on the Reconstruction of French Vineyards by Grafting.—Mons. L. Daniel says:—Contrary to the general belief, grafting has been found to change the character of the scion graft as well as of the wine produced from the fruit grown on it. The variation in vine and product is due in a large measure to change in nutrition which takes place as a result of the callusing of the grafted parts, and the consequent greater difficulty of sap circulation. By taking advantage of the changes thus brought about it is believed that it will be possible to produce by grafting new varieties which shall combine the good qualities of the French grapes with the phylloxera resistance of the American sorts. Grape growing by the use of direct producers is considered highly desirable, and scientists are urged to experiment along the line of the production of new varieties, by means of grafting, which shall be direct producers.

Potato Diseases and their Remedies.—Messrs. L. R. Jones and W. J. Morse say that the results obtained during 11 years' experiments with potato diseases indicate that the Bordeaux-arsenical mixture is superior to any other remedy. As a rule two applications have been found profitable. In 1903, however, the development of potato blight was checked by one application on account of the late appearance of the disease. One application of Bordeaux-arsenical mixture produced a gain of 12½ bushels per acre. The addition of "Bug Death" and Paris green to the Bordeaux mixture was apparently without much effect on account of the unusually small numbers of potato beetles and other insects. Neither Paris green nor "Bug Death" have any value in controlling potato blight, the Bordeaux mixture alone being quite effective.

Experiments were carried on for the purpose of determining the relation between the date of digging potatoes and development of the rot. Four rows of potatoes were dug on each of five days, that is, August 31, September 7, 14, 21, and 28. All of the potatoes were stored under similar conditions. The results indicated that whenever there is danger of rot it is best to delay digging the potatoes for ten or more days after the tops die.

A test of sprinkling potatoes with air-slaked lime before placing them in the cellar showed that this method is of no value in controlling the development of the rot.

In experiments with potato scab it was found that corrosive sublimate and formalin were equally efficient. The formaldehyde gas treatment, however, is recommended as preferable for this purpose. An air-tight room is required, and it is recommended that not less that one pound of formalin be used for each 1,000 cubic feet of space.

The Dry Rot of Potatoes Caused by Fusarium Oxysporum.—Messrs. E. F. Smith and D. B. Swingle write as follows:—This disease of potatoes has long been recognised in the United States and other countries under various names, such as bundle blackening, dry end rot, etc. The disease commonly enters the plants through the roots and slowly spreads until the whole underground portion of the plant is infected. In infected plants the fungus is always present in the darkened fibrovascular bundles of the tubers. The symptoms of infection are a slow change of color, the checking of growth, and slight curling of the leaves, followed by wilting and falling of the stems, The fungus grows readily in a considerable variety of culture media and tolerates comparatively large amounts of malic, citric, and tartaric acids. It is checked in growth, however, by formic, acetic, and butyric acids. The fungus is aerobic and grows most vigorously at temperatures between 15° and 30° C.

Dry rot attacks potatoes from the soil, and winters over in infected plants. The use of fertilisers, even in large amounts, failed to check the development of the disease. The fungus persists in stored potatoes, whether kept in moist or dry rooms, unless a low temperature is maintained.

It is recommended that infected land be planted in other crops for a number of years, and that the possibility of the disease infecting tomatoes, eggplants, and pepper be kept in mind. Great care should be exercised in the choice of seed tubers. Some difference in the resisting power of different potato plants to disease was noted, and further investigations will be conducted to determine whether highly resistant varieties may be developed.—Washington Experiment Station Record.

Vegetable Garden.

OPERATIONS FOR OCTOBER.

By W. S. Campbell.

During this month vegetables of almost all kinds and varieties are likely to make fine growth; that is, if the necessary attention has been paid them, and if there has been sufficient rain for their needs.

In many districts, where the climate in winter is very cold, a start may be made with the summer or tender vegetables. These include tomatoes, French beans, Lima beans, capsicums or chillies, melons, pumpkins, &c., and as these are important and useful, the best possible means available should be taken to raise them. The sweet potato might be included for the cool districts, for it will succeed in most parts of the State, unless, of course, frosts at unexpected times cut down the vines. It is worth risking a trial, for this vegetable is a good one, and a great change from that known as the Irish potato.

Asparagus may be planted in late districts if the plants have not yet developed their leaves. Where the shoots are just starting it will not be too late to plant.

Arrowroot is well worth growing wherever late frosts are not likely to appear. The plant generally grown for the production of arrowroot is the Canna edulis, which is closely related to the cannas grown for the beauty of their flowers, at one time generally known as Indian shot. Wherever these cannas succeed it will be safe to plant the other species, C. edulis. The best arrowroot is produced from a species of Maranta, a more tender plant than the canna. It succeeds well in the north-east coastal districts, but is not very much grown, the canna being preferred, apparently being more generally known for one thing, and easier to manage for another.

Beans of Kidney or French, and all other kinds except the Broad or Windsor bean, may be sown. There are numbers and numbers of varieties of these beans, some of which succeed well in some districts, and other kinds in other districts; growers, therefore, should try several varieties of the different kinds of beans, for the seed of most of them is inexpensive, and it only needs a little more than one bushel of dwarf beans to sow an acre. Some bean seeds are very much smaller than others; for instance, the snake bean seeds are very small in comparison with, say, the Canadian Wonder French bean. Seed can be purchased in Sydney at about 2/ a quart, and probably at much the same price from agents in the country. After a trial, seed of those varieties which succeed best should be saved; but it will be necessary to protect it from weevil and other insects.

Beet (Red and Silver).—Seed of these useful vegetables may be sown once or twice during the month if necessary. If plants of silver beet or spinach have been raised, it is possible that further sowings will be unnecessary.

Cabbage.—Sow a few seeds two or three times during the month, in order to keep up a small supply of young plants ready for planting when required. The variety known as St. John's Day is generally considered to be one of the best for the summer. Like other vegetables, the varieties are numerous, and it is only by actual trial in various localities that the best for any particular locality can be determined. One or two of the red varieties should be grown for pickling. Niggerhead is a new one well spoken of.

Cauliflower.—Sow a few seeds in cool localities only, and plant now and then a few well-grown seedling cauliflowers. Mr. T. Ellis, of the Howlong Viticultural Station, who is always eager to make trials of new vegetable seeds, reports on a variety known as Krempin's Earliest as follows: "It has proved to be of the highest grade, and it should be of great service as an early cauliflower, especially to private growers. I sowed the seed the first week in November, and commenced to cut nice heads the third week in April. The heads are very white and compact, and the flower all that can be desired. They grow to a nice size, and compare favorably with Autumn Giant, which I am now cutting (end of July). I had only one button in forty plants, which speaks well for an early variety, which I partly attribute to keeping them going without a check from the start. Another thing makes it very useful for private growers, and that is the plants do not head all at once; mine produced good heads for fully two months." I should like to mention here that these directions are intended solely for those who grow vegetables for their own use. Market gardening is an industry by itself, and many vegetables of perfect flavor and quality, and most useful and desirable for a private person to grow, would be unprofitable for a market gardener.

Carrot.—This vegetable is one of great use in the kitchen, and a very desirable one to grow all the year round wherever possible. There are some varieties quite small, others of a medium size, and others again long and large. The small and the medium kinds will probably be found the most useful. Sow a few drills to keep up a succession. Thin out the seedlings well when they are large enough to work amongst, and keep the plants free from weeds.

Celery.—Sow a little seed to keep up a sufficient supply of plants to meet all requirements, and plant out occasionally well-grown seedlings. Use abundance of manure, and blanch the plants when they are nearly full grown.

Cucumber.—In warm localities the vines should be growing well, but generally in the State sowing will just be starting, or if young cucumber plants have been raised under frames they are being planted, and should soon make a start. Pinch the growing leading shoots as they extend to induce the growth of lateral branches.

Cress and Mustard.—Sow a little seed from time to time during the month.

Capsicum or Chili.—Sometimes known as pepper, for the cayenne pepper of commerce is made from some of the small and hottest varieties. Seed may be sown during the month in seed bed, and when the seedlings are large enough to handle they may be planted out. Varieties are innumerable,

MUICAL EDUCATION.

There are many country homes, and also homes in the suburbs, where gardeners and their families greet an evening's recreation with music as a great boon. So it should be. The difficulty very often lies in the fact that while the piano or organ is there the musician is wanted. To supply this pleasure we are introducing from America a Chart of Musical Chords, arranged by Mr. Charles E. Pratt. By the use of these Chords, which any ordinary intelligent person can learn quickly without any previous knowledge of music, an accompaniment can be played to any song yet composed. In addition to the Chart the publishers supply a book of popular songs, containing 48 pages, all for the very modest price of 2s. 6d. and postage. On receipt of 2s. 6d. and postage 2d. we will send the chart and music to any address in the Commonwealth. An advertisement appears on page 16.

from quite small to gigantic in comparison. The largest are the mildest and are best suited for feeding, as a relish, to canaries. Some varieties are used for ornamental purposes in the flower garden. I sometimes grow capsicum in pots simply for ornament, and I find that when nicely grown they are extremely pretty.

Egg Plant.—Sow a little seed, or, if plants have been raised, plant out in a warmly situated, well-manured bed.

Kohl Rabi, or Turnip-rooted Cabbage.—Sow a little seed and transplant seedlings, and cultivate just as you should a cabbage.

Leek.—Sow a little seed in seed bed. Transplant any seedlings which have been raised and are large enough to handle. When preparing ground for their reception use manure most liberally. Plant in shallow trenches.

Lettuce.—Seedlings already raised may be planted out in well-manured ground, but towards the end of the month transplanting had better give way to the sowing of lettuce seed in rows where the plants are to grow. Plants thus raised and grown are less liable to run to seed during the warm weather than if they are transplanted.

Melons (Rock and Water).—Sow seed as extensively as may be required.

Maize (Sweet).—Very few persons seem to care for this vegetable, and it is but little grown here. The seed may now be sown in any districts where the ordinary maize will grow. Sow in rows about 4 ft. apart, and drop two or three seeds 1 ft. apart, thinning out to one plant if all the seeds come up. Cultivate the soil frequently between the plants.

Okra.—Sow a few seeds to raise seedlings for planting out. This is sometimes used for ornamental purposes in the flower garden, for it bears very pretty flowers which, however, emit a rather heavy overpowering perfume.

Onion.—Sow a little seed in drills if a sufficient quantity of seed has not previously been sown. A dressing of soot and salt, half and half, or of soot alone, to growing onions will be found useful.

Parsnip.—Sow a row or two occasionally if required. The ground for this vegetable should be dug deep, and if trenched to a depth of 2 ft. all the better.

Pea.—Sow occasionally during the month to keep up a good supply.

Potato.—Sow a row or two if required. Work the ground well amongst the growing potatoes, and never suffer any weeds to grow.

Pumpkin, Squash, Vegetable Marrow.—Sow seed to keep up supplies.

Rhubarb.—A little seed may be sown, if a supply of plants is required for planting out next season.

Tomato.—Sow seed if a sufficient supply of plants for present use has not been raised. Good strong seedlings may be planted out, except in the cold districts. Mr. Ellis tried a tomato, named Matchless, for me last season, and he says that "the tomato Matchless well deserves its name, for it is first-class, being a heavy and continuous cropper of large, handsome, smooth-skinned, bright scarlet, firm, excellent, flavored fruit. Its habit is robust, and it showed no signs of disease. I cut fine fruit the first week in January, and right through the season until the plants were killed by frost. Of the twelve varieties I grew last season, Matchless was by far the best; in fact, I consider it the best all-round tomato I ever grew."

Turnips.—Sow a little seed in drills.—"Agricultural Gazette of N.S.W."

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Believing that the educational value of this Chart cannot be over-estimated, "The Australian Gardener" has arranged with the publishers to supply Pratt's Chart of Chords (published at 5s.) to its readers at the reduced price of 2s. 6d. each, with 2d. added for postage, and in addition to the Chart of Chords the publishers have kindly agreed to send without extra charge a copy of the Coronation Musical Folio, containing 48 pages of sheet music, and instrumental by popular composers.

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All letters, manuscripts, and matter intended for publication should be addressed to the Adelaide Office, 61, Brookman's Building, and in order to appear in the following issue should be posted in time to reach Adelaide by the 20th of the current month. It is necessary that correspondents should furnish their names and addresses.

Advertisers.

Particulars of rates will be supplied on application.

Subscribers.

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Subscribers are asked to notify the Adelaide Office if they do not receive their copy of the paper; also any alteration of address.

Answers to Correspondents

"A. J. W."—No. 1: Myosotis—This variety is puzzling the best authorities to whom it has been referred. Please send another specimen, containing root and all. No. 2: Asparagus tenuissimus, from a, intense, and sparasso, to tear; in reference to the strong prickles on some species. This variety was introduced from South Africa. No. 3: Bignonia capensis, trumpet flower, named after the French Abbe Bignon. The same natural order as the Tecomas. This variety was introduced from the Cape of Good Hope; hence its name, Capensis. No. 4: Cotoneaster Simonsii, from Cotonea, Pliny's name for the quince, and aster, a corrupted name, meaning a star, or likeness—literally, quince like. The species was introduced from Khasia, and so distinct from the others, that its name is misleading. No. 5: Asparagus officinalis—The kitchen garden variety, known amongst English gardeners as sperage and sparrow grass. No. 6: Pittosporum macrocarpum, from pitte, to tar or pitch, and sporas, seed; seeds covered with resinous pulp. We have no record of where this variety was introduced from. No. 7: Œsculus hippocastanum—The name œsculus was given by Pliny to a kind of oak having an edible fruit. This particular variety is commonly known as the Horse Chestnut. No. 8: Epiphyllum truncatum, from Epi, upon, and phyllon, a leaf. Flowers borne on the edges of the leaf like branches. Introduced from Brazil. This variety will take budding from other cacti, and makes very interesting work. No. 9: Pyrethrum roseum—This is commonly known as Feverfew. From pyr, fire, alluding to the acridity of the roots. Hooker and Bentham unite the genera of the Pyrethrums and Chrysanthemums. Mostly introduced from Asia. No. 10: Coronilla glauca—From corona, a crown or garland, referring to the disposition of the flowers. A pink creeper of the same family named Varia, contains a poisonous juice. Glauca was introduced from France. No. 11: Nephrolepis exaltata, from nephros, a kidney, and lepis, a scale, referring to the covering of the seed or spore cases. This fern was introduced from the tropical parts of America. No. 12: Fabiana imbricata, named after the Spanish naturalist Fabiano. Introduced from Chili. In appearance much like Cape Heath. Does not belong to the Erica orders.

"Sweed & Son."—1. Cuttings of Ericas should be put in during winter months. 2. The points of shoots. 3. Insert in sand, the pots being half-filled with drainage, and then filled with sandy peat, rough peat over the drainage, fine on top, surmounted by half an inch of silver sand, well pressed and watered, left and then pressed again a day before using. Cover with a bell glass and set in a close pit or frame. Put the cuttings three or four round the sides of small pots for the first winter, singling them out, and then keeping them close the following spring. Harden them off by degrees as larger pots are wanted. Protection from sun in summer, abundance of air in winter. They strike within a month.

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The Flower Garden

OPERATIONS FOR NOVEMBER.

The season has been most favorable for flowers, and the wealth of bloom during last month ladened the air with a beautiful perfume. It seems a pity to cut flowers, especially Roses, but for the sake of the bushes the blooms should all be cut with long stems. The bushes will keep blooming all the longer. The new shoots that will form will throw more flowers. Dahlia tubers should be planted out. Chrysanthemums will need careful watching for with the favorable season suckers will come on apace. These should be cut off. The bulbs should this month give much satisfaction, and it will be interesting to note what advance is being made with Gladioli. Annuals can be planted out, and do not forget a plentiful supply of Zinnias, Balsams, and Gaillardias. Cosmos of course will be plentiful, and the orange colored Klondyke will be more in evidence this season. We would like to see more attention paid to Ixias, to Irises, and to the old time Mesembrianthemums. The latter flowers provide a gorgeous array of colors in the summer gardens, and so do the Portulaccas. Both require very little attention. Do not forget the mulching.

Though it is a commendable ambition to strive to make your yard more attractive than your neighbor's, it can never be accomplished by beds of stiff design and gaudy color, by large and obtrusive objects, or by masses and mounds of unsightly rock, statuesque fountains and the "ornaments" that are resorted to in so many cases. Such a course is the farthest possible from the dictates of Nature.

Beauty, simplicity, and harmony are the three principal objects to be sought after, and when these are obtained the effect cannot be otherwise than pleasing. Beauty without simplicity, in landscape gardening, is certainly unattractive. An object may be beautiful in itself, but when associated with others its beauty may be enhanced or otherwise, depending largely upon the colors placed in contact with it. Then, too, the habit and general style has much to do with the effect. Some trees lose their beauty if placed where they merge their individuality in a mass or clump of trees. How majestic the appearance of many of our isolated specimens, and how inferior do they appear when grouped with other trees.

On the other hand, simplicity without beauty shows a lack of taste. Nothing can be more pleasing than to see beautiful colors harmonising, no one more conspicuous than the others, and each showing to the best advantage.

Again, we cannot omit harmony. It is extremely difficult to lay out any garden in perfect proportion, with no discordant feature, if we omit any one of these three principles. Follow the dictates of Nature wherever possible. But even in this you may go to extremes. You cannot expect to make a house on a narrow city lot appear as though it were in the midst of a forest of native shrubs and trees. We frequently see a small lot so completely filled with plants that even a square foot of lawn is impossible, and where all colors, beautiful in themselves, become completely lost in the vast quantity of them.

Architecture and landscape gardening are two quite distinct arts, but where we find one, we frequently meet with the other. Perhaps that is the reason you see the name of landscape architect. Architects they may be, but landscape gardeners, never! Alas, the architects who are at the same time landscape gardeners are few. It will never do for an architect to try his art on a stretch of lawn. His straight lines, square corners, and sharp angles are just what we must avoid in landscaping. Natural curves are the most attractive; have Nature's lines in all your work. Usually one who styles himself a landscape architect has as little conception of the work his title covers as he has of the work itself.

Study the best methods by which the full beauties of Nature may be developed and shown in the piece of land under consideration. The salient points of land are its long and broad views, its low and high spots, its distances, buildings and any other special features that it may be desirable to note in the line of general observation. These leading features are the keynote to all further progress. Our eyes possess the power of gauging natural beauty by the laws of contour, profile, and perspective. When straight lines are placed on land to make the principal impression, the arrangement is false to nature and art. It is impossible to portray on paper the impressions of Nature; it is very difficult to even convey indications of them; they are at best like notes of music compared to the music itself. Study groups of some particular tree, watch their variatins in all sorts of light and shades and positions, and you will learn much.

DISEASES OF CARNATIONS.

By Charles Knopf.

You will need to begin fumigating as soon as you can, for you can get rid of the aphis and thrips much quicker before the plants begin to bud. Be sure you make a good job of it. Fumigate every night the first week, three nights the next week, and then two, and finally one night every week; so doing will keep the plants clear of thrips and aphis.

Leaf Spot.

If you have had a great deal of rain in your locality, or more rain than you think the plants needed in the field, you must keep a close watch for this dreaded disease, as when the plants begin to make growth the disease will spread rapidly. You can easily discover this trouble, for at first it is a solid spot of purple, and as the plants age it will turn brown in centre, with small black spots, the whole being surrounded with a purple ring. This disease almost always starts on the foliage, and will work toward the stem. First, let your plants be in the dry side, and have a free circulation of dry air day and night. Of course, you do not want your plants to wilt, but at the time of watering keep the water off the plants. Syringe with the following solution, three times the first week and twice a week after that, until the disease is gone. Use one pound sulphate of copper dissolved in hot water; two quarts ammonia; dilute this with thirty gallons of water. This disease and solution I have spoken of before, but just at this time of the year, when we have our plants all planted, this is more apt to trouble us. Sometimes this disease is on the plants in the field, and at planting time, when one has to syringe his plants a great deal, it is sure to cause its active growth. Dry atmosphere, in conjunction with less water at the roots, is a good check, but one is compelled to use the solution in order to get rid of it entirely. You can easily tell when the disease is checked, for the leaves dry up; these should be picked off and burned.

Surplus Growth.

Some varieties, when growing in the field, will appear to be extra fine plants, but you should examine them closely now that you have them established in their winter quarters. When topping in the field and in the house one cannot help skipping a few now and then, no matter how careful he may be. The heart, as I term it, will sometime break off; this will grow to a certain stage and then small weak shoots will appear from the top of this shoot; these, from all appearances, will make a fine-looking plant, but the shoots should be cut off as low as three joints—that is, three joints that you are sure will give you good breaks, for, if you leave these to bloom, they will not only give you poor flowers on weak stems, but will affect your plants for the rest of the season.

Replanting.

Be sure you take up enough plants from the field to replace those that die out. Pot them and treat them the same as you would those you planted in the bench. This you will find better than to replant directly in the bench, having to shade each plant. The bench might not look as well with vacancies here and there, but if the plants in pots are not neglected they will soon be ready to set in the bench, and will begin to grow at once. Be sure you pot a good many more than you think you may need.

MUICAL EDUCATION.

There are many country homes, and also homes in the suburbs, where gardeners and their families greet an evening's recreation with music as a great boon. So it should be. The difficulty very often lies in the fact that while the piano or organ is there the musician is wanted. To supply this pleasure we are introducing from America a Chart of Musical Chords, arranged by Mr. Charles E. Pratt. By the use of these Chords, which any ordinary intelligent person can learn quickly without any previous knowledge of music, an accompaniment can be played to any song yet composed. In addition to the Chart the publishers supply a book of popular songs, containing 48 pages, all for the very modest price of 2s. 6d. and postage. On receipt of 2s. 6d. and postage 2d. we will send the chart and music to any address in the Commonwealth. An advertisement appears on page 16.

ROSE NUMBER.

"A queen more wonderful
Than any who have bloomed on Orient thrones;
Sabean Empress! in her breast though small,
Beauty and infinite sweetness sweetly dwell
Inextricable."

THE ROSE.

By Mr. A. H. Scarfe.

Mr. A. H. Scarfe, of Unley Park, has been head of the list of rosarian prizetakers in Adelaide for many years, and his enthusiasm for the Queen of Flowers makes his prizetaking always popular. We are pleased to have an introduction from his pen to our Rose Number, and also to present some illustrations from his garden, where the champions were cultivated.

The pursuit of floriculture has from time immemorial possessed a great attraction for a large proportion of civilised humanity. As a recreation it attracts both young and old; as a means of livelihood it differs from the great majority of occupations which men engage in, many of which are absolutely distasteful to those who practise them. Such, however, is not the case with the majority of those who enter upon floriculture as a profession. The very nature of the occupation, its charming variety, the thousand and one forms of plant life with which the florist is brought into contact, redeem it from the unending monotony which in too many pursuits relegates men to the position of mere machines, and affords but little scope for the development of the finer faculties, and the growth of a refining influence. To the florist who is brought into direct association with Nature in some of its most attractive forms, the continual introduction of new and improved types of floral beauty, the result of the skill and untiring patience of the hybridiser, is ever productive of an interest which never grows stale because of the influence it exerts in stimulating further research and experiment into new paths, and quickening in the ambitious mind the desire to produce something new. There is an innate love for flowers in the human heart, and even those who are most callous and indifferent in other respects are not insensible to their influence. It has been said: "Give a man possession of a barren rock and he will soon start a garden," and although, as an old gardener once remarked, "Flowers may not make the pot to boil," they are, as every one knows, a source of much genuine pleasure, and their cultivation gives a return in health and happiness which has as certain a monetary value as if the cash actually found its way into the pocket. It may be taken as a floricultural axiom that the rose occupies the position of pre-eminence amongst the myriads of flowers which are to be found the world over. Beauty of form, infinite diversity of color, delicate and unsurpassed fragrance, are qualities which entitle her to the appelation of "Queen of Flowers." The poet Cowper about the middle of last century, wrote:

The nymph must lose her female friend,
If more admired than she:
But where will fierce contentions end
If flowers can disagree?

Within the garden's peaceful scene
Appeared two lovely foes,
Aspiring to the rank of queen—
The Lily and the Rose.

The Rose soon reddened into rage,
And swelling with disdain,
Appealed to many a poet's page
To prove her right to reign.

The Lily's height bespoke command—
A fair, imperial flower—
She seemed designed for Flora's land,
The sceptre of her power.

This civil bickering and debate
The goddess chanced to hear,
And flew to save, ere yet too late,
The pride of the parterre.

"Yours is," she said, "the nobler hue,
And yours the statelier mien,
And till a third surpasses you,
Let each be deemed a queen."

Thus soothed and reconciled, each seeks
The fairest British fair;
The seat of empire is her cheeks—
They reign united there.

Notwithstanding this pretty sentiment of Cowper's, it must not be forgotten that centuries before the poet lived, the rose had taken its place as the Queen of Flowers, and had been adopted as the national flower of England.

Of all the flowers that have been altered in character by careful selection, and by the cultivation of the gardener, the rose perhaps holds first rank. It occupied a prominent place in the gardens of Egypt 3,000 years or more before the Christian era; the rose gardens of Persia—the natural home of the rose—of Syria, and other eastern lands are still, as they have been for ages, the wonder and delight of travellers. The historian Pliny speaks of twelve different varieties of this flower which were cultivated by the Romans, and it is on record that the Emperor Tiberius, in addition to forcing cucumbers, also forced roses in houses, where thin sheets of talc or mica were used as a substitute for glass. It is in our own time, however, in which the greatest contributions of new and improved varieties have been made. In no part of the world is the rose more universally or enthusiastically cultivated than in the mother country, where the names of the most skilful rosarians are house-words, and the shows of the National Rose Society have a world-wide reputation. In the cultivation of the rose there is no royal road to perfection. There are no mysterious secrets that I am aware of practised by professional gardeners, which, all things being equal, should give them the pre-eminence in the production of specially good flowers. This is borne out by the fact that in England some of the most distinguished rosarians are amateur growers, who time after time have made the professionals "sit up" by wresting from them the coveted trophies of the exhibition table as tributes to that persevering industry and determination to excel which all must practise if success is to be achieved.

Plant well in the first place, manure well, prune with discretion, give abundance of light and air, and I have found little else necessary. These are the chief factors to success, but these are indispensable. The rose is thoroughly cosmopolitan; she impartially bestows her favors alike on the prince and the peasant. She blooms with equal excellence in the garden of the humble cottager as in the expensively arrayed and ornate domain of the millionaire; gives an added charm when worn by feminine beauty, and brightens with color and refreshes with fragrance many a sick chamber. To any who may be induced by these stray thoughts to pay some attention to rose culture, I can promise from my own experience that it will prove a satisfying hobby. It will entail a certain amount of hard work, but hard work rarely kills, and in this case it is work that will prove to be a recreation; it will induce the very excellent habit of early rising, for is not the early morning the time for unalloyed enjoyment when moving about amongst your rose trees. It will enforce promptitude of action, for there must be no procrastination where the treatment of roses is concerned, especially in the matter of aphis and caterpillars, and it is a hobby which will prove in many ways an effectual antidote to those carking cares and worrying anxieties which seem to be inseparable from everyday life. As a mental discipline, therefore, as a botanical study, as affording a means of outdoor recreation which results in intense enjoyment to ourself and one's friends, I can confidently recommend the culture of that exquisite flower to which we more especially do homage. One other remark by way of a warning. I have amongst several of my friends enthusiastic gardeners whose space of ground unfortunately is not in due proportion to their ambition, seen the development of such an enthusiasm in their floricultural pursuits as almost to induce the belief that the rank weed of selfishness had taken firm root within them. Every inch of space has been gradually encroached upon until their unfortunate wives, who are, after all, the true perpetual home roses, have been driven to use the back verandah as their drying ground, and are in daily expectation of receiving orders to fix their clothes lines on the roof or take them to the front street. In all things a happy medium should be observed, and I feel satisfied in leaving it to the fair and impartial consideration of those present to endeavor to place a check upon such enthusiastic ardor, if desirable, amongst any of their friends, for I trust there are none but desire to treat the roses of their home-life with the tenderest care, consideration, and affection.

THE ROSE SHOW IN ADELAIDE.

The Queen of Flowers held her reception in the Adelaide Town Hall on October 20, and those who were responsible for the display may generally be congratulated on the effect. Critical rosarians may have found mirers without the special privilege of criticism could hardly have much to complain of amongst the prize-winners. Mr. A. H. Scarfe and Mr. H. Kemp were again the leading exhibitors, and the blooms staged by them well merited the eulogiums and congratulations of the public, as well as those of growers who know something about the flowers. Mr. Scarfe entered over sixty Roses, and every one of them was a contributor to his eight prizes. His Dr. Rushplen and Kaiserin Augusta Victoria took the two champion prizes in their respective classes, and it would be difficult to pick two better specimens, although, as usual, some thought they could have selected better blooms. The judge, however, knows his business thoroughly, and made his selection not to please any carping critic that might happen along.

Mr. H. Kemp's two exhibits of 48 and 24 were a splendid lot, and stamp him a past-master in the art of growing Roses. In addition to their general excellence, they were well staged and named. The example set by both Mr. Scarfe and Mr. Kemp is well worth the attention of exhibitors. Other exhibitors who have good reason to be pleased with their competition were Mr. E. Gries, Mrs. W. Thomas, Mr. E. Hall, Mr. W. Harris, Mr. B. Mitchell, and Mrs. A. Halton. Each of these competitors staged some lovely blooms, and should they continue with their efforts the champions will need to look to their laurels, or they will lose them.

The Adelaide prizetakers are getting to be almost patriarchal in their successes. We refer to Henry Sewell as one. A show without prize exhibits from Mr. Sewell's nurseries can hardly be imagined. His list of prizes must be legion, and it is gratifying to note that there is no abatement of excellence in his beauties. Mr. Sewell, Mr. W. J. Smith, and Mr. W. H. Ind had a battle royal with their Pelargoniums. The names of the zonale varieties are worth giving, as they were such a splendid lot:—Singles: Mr. Actson, M. Pole Routh, Norah, Louis, Distinction, Swanly White, Rev. H. Harris, Phyllis, Gabriel's Host, M. L. Tesdale, Snowdrop, Fairest of the Fair, Sir Henry Irving, Duke of York, Mrs. Strutt, Madame Bruant, Duchess of Fife Doubles: Madam Charlotte, Ville de Porteers, Emile de Girardin, MadamTihnout, Blanch Perfecta, Cousin Bell, Sylvia, Madame Thifiant, Jean de Arc, Mrs. W. E. Gladstone, Madam Vaudry, Agalia, M. J. B. Jerome.

Mr. H. Dutton also entered the list with them, and the twelve regals for which he was awarded first were the most perfect trusses imaginable. Another of the patriarchs is the family of Newmans. It seems like ages since this firm entered the prize-list at the Adelaide Shows. Like their doughty competitor, Mr. Sewell, their names appear all through the list as first or second. To describe the exhibits would need a catalogue, which, by-the-way, we should have exceptional pleasure in printing for them.

Turning to some of the later day prize-takers, we note Mr. E. Gries coming along very strongly with sixteen awards, and amongst them some well worth the winning. He had a special lot of Roses of distinct varieties set up in vases, and a good exhibit it was too. His Phloxes, which gained two firsts, were good, and we wondered where all the other competitors were. Surely this beautiful flower cannot be going out of fashion. Among his list of prizes were Pentstemons, Double Gaillardias, Gladiolus, Climbers, six plants for table decorations, a Cactus, Farfuguim, Ligularia, a new hardy shrub Philade Falconeri, a new Hypericum Morserianum, and a Salvia splendens, Rudolph Pfitzner.

Mr. James Beggs is by no means a new name in the prize lists; indeed, we are afraid his long lists of prizes will soon bring him up to the patriarchal section. For years he has been a most consistent winner, and still going strong, as his list this year shows. In Carnations he had Cecelia, which took champion as a spring bloomer (a fine flower). In the champion decorative class, Dorothy Whitney, which, in the opinion of many growers, ought to have scored. For three fancy decorative, first were Stella, Prosperity, Dorothy Whitney; in three selfs, first Harlowarden (a very fine crimson), Gov. Woolcot, and Harry Fenn. The above six are American, and new to Australia. Amongst the flowers not for competition, shown without any artificial aid, were Columbines in fifteen varieties of the long-spurred type, single Gaillardias, splendid for decorative work, Sweet Peas, Shirley Poppies, Schizanthus (fancy), very pretty for table work, single Petunias, Carnations, Candytuft, a fine type of Pansies, fancy kinds. Also two new Ivy Pelargoniums, Leopard and Mrs. Hawley, variegated parsley, and double white Pyrethrum. The naming and staging of Carnations were favorably commented upon, and in all respects his exhibits were worthy of his reputation.

Mr. J. McInnes is another comparatively young prizetaker, although his list is lengthening out, as it well deserves to do. Carnations, spring blooming, 3, Triumph, H. K. Mayor, seedling; tree, show, selfs, 3, Richard Douglas, Arthur Fripp, Rosy Morn; tree, show, fancy, 6, Dr. Beetson, Mrs. J. Kaleski, Evangelene, Dandaloo, Gertie Reid, Ben Pfaendler; 6 Carnations, any variety, Dr. Beetson, Ben Pfaendler, Flinders, H. K. Mayor, Triumph, Pasedena; 6 Verbenas, Mayor of Geelong, The Alderman, Leviathan, The Duke, Mrs. J. H. McInnes, Queenie. A few of his leading annuals were Candytuft, Annual Chrysanthemum, Godetia, Clarkia, Jacobea, Centranthus, Statice Sumarama, Calliopsis, Schizanthus, Creepis, Phacelia, Helepterum.

Another new competitor we found in Mr. E. A. Kempson, who took first prize for 6 Pansies (fancy) and second prize for 3 Petunias (double), from seed from H. Sewell; second prize 6 Carnations, any varieties, distinct, consisted of Ravenswood, Striped Perfection, Zouave, Magna Alba, Cecelia, and Bohemia; second prize 3 Carnations, any variety, distinct, Ravenswood, Zouave, Pasadena.

The Carnation and Picotee Society made special arrangements for their offer of prizes for exhibits, which were a source of special attention from visitors. The blooms were undeniably good, showing that the young society is making headway in popularising this flower. Dr. R. E. Harrold with Edith Grey and Mr. J. Beggs with Cecelia and Messrs. Heyne, Potter, & Co., with Murmur divided honors for the three champions. Mr. D. F. Laurie got a well-merited first for 3 show tree Carnations, viz., Superior, Mrs. Kaleski, Edith Grey, and also exhibited "Not for competition" one vase, Miss G. Laurie; one vase, Camperdown, which excited a great amount of admiration. These two were raised by him from hand-crossed seed of his own growing. Miss G. Laurie is a perfect show bloom, produced on long stems, grand calyx, which never bursts, smooth petal, perpetual bloom, grand habit, shell pink. Camperdown, primrose yellow, flaked and pencilled scarlet, almost always smooth in petal, perfect calyx, long stems, good habit, profuse bloomer, a most attractive flower. Both these are of a type to be highly recommended.

CHAMPION ROSES.

As usual the great interest of the National Rose Society's Show at Crystal Palace, London, centred in class No. 1—the champion trophy class, open to nurserymen. Seventy-two blooms, distinct varieties, are required, and for the best set a prize of £6, together with the trophy and gold medal, are awarded. The first prize was won by Messrs. A. Dickson & Son, Newtownards, County Down, Ireland, who had full handsome blooms, and all well colored, though many an outer petal was blemished by rain or wind. The back row blooms were Marchioness of Londonderry, Captain Hayward, Souvenir d'un Ami, Charles Lefebvre, Mrs. J. Laing, Ulrich Brunner, Alice Lindsell, Janet Scott, Robert Scott, Marie Verdier, Merville de Lyon, Gustave Piganeau, Marchioness of Dufferin, Star of Waltham, Madame Hoste, Earl of Dufferin, Caroline Testout, François Michelon, Comtesse de Serenye, S. M. Rodocanachi, Maman Cochet, Helen Keller, Her Majesty, and Etienne Levet; centre row, Duke of Fife, Kaiser Augusta Victoria, A. K. Williams, Bessie Brown (good), Tom Wood, Mrs. Mawley, G. H. Mackereth, Margaret Dickson, Gladys Harkness, The Bride, Shandon, Florence Pemberton (new, creamy), Marie Baumann, La France, Mrs. W. J. Grant, Comtesse de Nadaillac (very pale), Madame Hausmann, Mildred Grant, Marie Rady, Souvenir d'Elise Vardon, Alfred Colomb, Hon. E. Gifford, Horace Vernet, and Madame Eugene Verdier; front row, Ernest Metz, John Stuart Mill, Marchioness of Downshire, Dupuy Jamain, Avoca, Comte Raimbaud, White Lady, Mrs. Sharman Crawford, Souvenir de S. A. Prince, Xavie. Olibo, Anna Ollivier, Duke of Wellington, Niphetos, E. Y. Teas, Lady Mary Fitzwilliam, Oscar Cordell, Madame de Watteville, Marquise Litta, Baroness Rothschild, Duchess De Morny, Muriel Grahame, Prosper Languier, Daisy, and Alice Grahame.

The best forty-eight distinct, also from Mr. Hugh Dickson, Belfast. The varieties were Gustave Piganeau, Baroness Rothschild, Mrs. J. Laing, Mrs. Sharman Crawford, François Michelon, Marchioness of Londonderry, Etienne Levet, La Fraicheur, S. M. Rodocanachi, Marchioness of Dufferin, Marquise Litta, White Lady, Captain Hayward, Madame E. Verdier, Ulrich Brunner, and Caroline Testout, in the back row; Marchioness of Downshire, Lady Mary Fitzwilliam, La France, Horace Vernet, Bessie Brown, Mrs. Hugh Dickson (new), Mrs. E. Mawley, Comte Mainbaud, Mrs. W. J. Grant, A. K. Williams, Duchess of Albany, Duke of Wellington, Mrs. W. F. Sandford, Miss Jeannie Dickson, Margaret Dickson, and Duke of Fife, in the centre row; and Helen Keller, Madame Cadeau Ramy, Comtesse de Ludre, Elise Fugier, E. Y. Teas, Killarney, Tom Wood, Bridesmaid, K. A. Victoria, Ernest Metz, Beauty of Waltham, Miss E. Richardson, Danmark, Cleopatra, J. S. Mill, and Souvenir de Eugene Verdier, in the front row.

ROSA RUGOSA AND ITS HYBRIDS.

By W. J Bean.

Of all the wild types of Rosa, R. rugosa is perhaps the sturdiest and most robust. It is also one of the hardiest. R. kamtschatica, which is now regarded as a form of rugosa, was introduced in 1802, but it was not till 1845 that the true rugosa reached Europe. It does not appear to have attracted any particular notice for a long time after that date. During the last few years, however, it has become a popular rose, and has been extensively crossed with other species and garden varieties. These rugosa hybrids already form a considerable group, and are being added to every year. If they do not equal the teas and other garden races in beauty of flower they possess certain qualities wating in their showier rivals. In the first place they are considerably hardier and can be grown almost anywhere, where the teas and even the H P's. are too tender to succeed without protection. In the beauty of their foliage and very frequently in that of their fruits they are also superior.

R. rugosa is a native of Japan, where according to Siebold it frequents sandy pieces of ground near water. The Japanese call it "Hamma nasi," which, being corrupted into "Ramanas," is sometimes used as a popular name for the rugosa group of roses. Several varieties of it are cultivated by the Japanese and Chinese, and many hundreds of years ago it was used by the ladies of the Chinese court for making a pot-pourri by mixing the petals with musk and camphor. The shrub grows from four feet to six feet high, and its branches are very densely armed with straight prickles. For making a beautiful informal hedge, or for planting in groups in semi-wild parts of the garden, this rose is admirable. The foliage is very handsome, the leaflets being of a rich green, firm texture, and distinguished by the rugose (or wrinkled) surface to which the name refers. In the wild type the flower is single, three inches or more across, and either rose-colored or white. The fragrance is charming, a quality which, happily, most of its progeny also possess. Lastly, as a fruit-bearing rose, this is almost unequalled, its large, orange-shaped hips being of a bright coral-red. The only pruning it needs is an occasional removal of old, worn-out wood Nothing in the shape of systematic shortening back must be done. Some of the more pendent growing sorts mentioned are sometimes grown as standards budded on the briar.

R. rugosa is one of the easiest of roses to hybridise. When planted near other species the transference of pollen by bees will often result in hybrids appearing among the seedlings. Such haphazard crosses, however, are seldom of value, and are, in fact, too numerous already. What is wanted is a careful selection of parents with a view to producing new and distinct crosses of similar quality to Madame Georges Bruant, Mrs. Anthony Waterer, and such like. The following is a list, with brief descriptions of the rugosa hybrids and varieties that have come under my notice. They are particularly to be commended to the notice of those readers whose gardens are situated in the more inclement localities.

Alba, flowers single, pure white. Plant in other respects similar to the type. Alba microphylla is a smaller, more bushy form.

America, more valuable for its fruits (which are large and handsome) than the flowers; the latter are crimson, and slightly double.

Andreæ, a cross apparently with the sweet briar or a similar rose. I have not seen the flowers:

Belle Poitevine, a very handsome variety. The flowers are very large and double, and of a clear rose color. It keeps in flower for many weeks, and is a vigorous grower.

Blance double de Coubert is perhaps the best of the white rugosa roses. The flowers are very large, double, and pure white. Mr. W. Paul compares the bud to that of tea rose "Niphetos."

Calocarpa, a strong growing variety, particularly attractive when carrying its fruits, which are scarlet and borne in large clusters. Flowers single, rose colored Raised by M. Bruant from rugosa and Bengal rose.

Chedane Guinoisseau, flowers double, bright rose, and of large size. The fruit also is very handsome. A good variety.

Comte d'Epresmenil, one of the oldest garden varieties. A vigorous grower, with semi-double purplish-crimson flowers.

Flore pleno, the flowers of this are very double, but not of the largest, and purplish-crimson. It is a grower of medium strength.

Fimbriata was raised from rugosa crossed with Madame Abel Carriere, by M. Morlet in France. Flowers pure white, petals fringed. An interesting and pretty plant.

Germanica has pure white, very double flowers, similar to those of Blanc double de Coubert; habit also similar.

Glabriuscula, flowers single, pink; foliage dull green.

Hargita, flowers double, bright rose. A hybrid with a tea rose.

Heterophylla. This is new to me this year, but is one of the most promising of the rugosa hybrids. It seems to be the result of a cross with some Polyantha rose. It has a free, graceful, spreading habit, and its flowers are pure white, double, and two inches across.

Himnalayensis. (See flore pleno.)

Iwara is a hybrid between R. multiflora and R. rugosa. It was introduced from Japan, and is probably a natural hybrid. Flowers single, pure white, and small, but produced in large clusters, as in multiflora. It is a shrub of free and graceful habit, but its flowers are short-lived, and few are open at one time.

Jelina is probably a hybrid with some tea rose. This is not so strong-growing as the majority. The flowers are double, and of a lovely shade of deep rose.

Kamtschatica, a wild variety of rugosa, with a strong habit and large leaves. Flowers single, dark rosy-crimson. Wood not so prickly as ordinary rugosa. Introduced in 1802.

Lible, a hybrid with some tea rose, and one of the most robust of that group. Flowers single, vivid rose color.

Madame Charles Fred Worth, a very distinct hybrid (probably with a H.P.) of erect and vigorous habits. The leaves are largest among the rugosa crosses. Flowers very full and fragrant, crimson.

Madame Georges Bruant. This beautiful variety is one of the best known of the rugosa hybrids. It is of vigorous growth and produces its large, double, pure white flowers in clusters. Tea Rose "Sombreuil" is one parent.

Mrs. Anthony Waterer, raised at the Knap Hill Nursery by crossing rugosa and General Jacqueminot. It is one of the best of this race, flowering with great profusion, and being one of the most fragrant of all roses. Flowers crimson, semi-double.

Nitens, figured many years ago in the "Botanical Register" (t. 824), I do not know if this be still in cultivation. It is allied to kamtschatica, but the leaves are shining on both surfaces.

Rose Apple is most noteworthy on account of its very fine red fruits, but in habit, leaf, and flower is one of the most ornamental. Flowers semi-double, satiny rose.

Souvenir de Christophe Cochet, a vigorous, fine fruiting variety; flowers rose colored.

Souvenir de Pierre Leperdrieux, although similar in habit and foliage to Bolle Poitevine and others, this is distinct in the dark shade of its flowers, which are deep rosy crimson.

Souvenir de Yeddo, flowers pink.

Tamogled, a cross with a H.P. or a Tea rose; flowers rose.

Thrusnelda is another Tea or H.P. hybrid; flowers deep rose,

The following are rugosa hybrids in the collection at Kew, whose parentage is known, but which have not yet been named:—

Rugosa x General Jacqueminot.—An American hybrid with the same parentage as Mrs. Anthony Waterer. It is, however, very different. The flowers are single and of a rich crimson or carmine, not unlike that of Paul's Carmine Pillar. A strong grower.

Rugosa x macrophylla.—Habit tall and vigorous; flowers single pink. This has no particular merit.

Rugosa microphylla.—Rosa microphylla is fairly well known as a sturdy bush with pealing bark, large fragrant single flowers, and large, yellowish, very spiny fruits. This hybrid resembles it a great deal, but the flowers are much larger—between 4 inches and 5 inches across. It was sent to Kew by Mons. Maurice Vilmorin, and is one of the finest single roses.

Rugosa x rubiginosa.—The Sweet Briar influence is seen in the smaller flowers of a pink color, and in the free graceful habit.

Rugosa x Wichuraiana.—This is perhaps the most striking of all the rugosa hybrids. The parents are very dissimilar, yet its origin is unmistakeable. The flower is 2½ inches across, single, and of a lovely clear rose. The leaves, whilst they show rugosa in the wrinkled surface, are like Wichuriana in their glazed appearance. The habit is semi-prostrate and very vigorous, and the stems are well-armed. This hybrid was raised in the United States.—"The Gardeners' Magazine."

A HAMPSHIRE ROSE-HOUSE.

By Alex. J. Arbuthnot.

I wish to describe a small rose-house which I built at this place six years ago, and which at the time of writing (May 10) is in bloom. The house is 24 ft. by 12 ft., outside measurement. On this point a mistake was made by the builders, the intention of Mr. Frank Cant, who kindly supplied the design, having been that the dimensions of the house should be 24 ft. by 12 ft., inside measurement. This would have made a not inconsiderable difference in the number of plants the house would accommodate. As it is, the house contains 72 roses, of which six are standards, six climbers, and the rest dwarfs. One of the climbers is the old Noisette rose Solfaterre. Another is Celine Forestier, both of which produce a very charming picture by the lavish abundance of their flowers. It is mainly owing to the effect produced by the Solfaterre, when trained under the roof of the house, and having regard to the notion commonly entertained that this old rose has now become practically worthless, that I am induced to write this paper. The Rev. A. Foster Melliar, in his otherwise excellent "Book of the Rose," describes Solfaterre as follows:—"Solfaterre (Boyan, 1843).—A Noisette of strong climbing growth, with large open loose blooms of little merit. It is tender, not so good as Lamarque, a poor autumnal, and would probably never have been heard of it it had been raised at a later date."

I feel sure that Mr. Foster Melliar would revise the foregoing opinion if he could see this rose with its 50 clusters of pale sulphur-yellow blooms, as it hangs along the whole length of the eastern side of the house which I am now briefly describing. It is not an exhibition rose in the ordinary sense of the term; but the luxuriant growth and masses of flower constitute an exhibition in themselves, each individual rose opening widely, but compactly, and with much greater effect than the more sweet-scented Lamarque, with which Mr. Foster Melliar contrasts it unfavorably. Celine Forestier, which is also trained under the roof, along the west side of the house, has only reached half the length of Solfaterre, but is flowering profusely with 35 clusters of yellow roses and innumerable buds. Another feature in the rose-house is a plant of L'Ideale, which has covered one of the supporting pillars at the south end of the centre bed, and flings about its gorgeously colored buds and widely opened flowers in rampant prodigality.

In the transverse border at the south end there is a standard Madame de Watteville, which during the last three years has been remarkable for the size, color, and number of its flowers. To this rose hangs a tale. The plant arrived, to all appearance, seriously injured in the railway journey. A considerable portion of the bark had been scraped off the stock, and my gardener doubted whether it was worth planting. I thereupon directed him to try an experiment which I had seen successfully adopted in connection with the manufacture of quinine on the Neilgherry Hills in India. This was to swathe the stems of the cinchona trees with moss, which was constantly wetted, until a fresh surface of bark had formed. This process was applied to the injured stock of the rose in question. It was perfectly successful, and subsequently, a year or two ago, the same process was adopted with an equally satisfactory result in the case of the Solfaterre, which had become cankered at the junction of the stock and the scion. Other very successful standards are Medea, with 12 beautiful blooms, Souvenir d'un Ami, with 35 blooms, and Lamarqe, with 20 very sweet-scented clusters and many vigorous buds.

Nearly all the roses in the rose-house are either Teas or Noisettes; the exceptions being General Jacqueminot, Prince Camille de Rohan, Pride of Waltham, Caroline Testout, and Mrs. W. J. Grant, the three last of which are Hybrid Teas. Among those in great beauty are Jules Finger, with three perfect flowers, Madame Hoste, with same number, The Queen, Enchantress, Comtesse Panisse, which, however, appears to be a very shy bloomer, but like Antoine Rivoire is a model, both as regards color, shape, and substance, when it does flower. Special mention must be made of Perle des Jardins, Sunset, and Madame Chedane Guinnoisseau, all very free flowerers, and covered just now with their bright yellow blooms. Empress Alexandra of Russia, which has only been recently planted, promises well. None is more free-flowering than Madame Lambard, but a sunny morning, in spite of careful shading, speedily impairs the beauty of its charming rosy buds. Mrs. W. J. Grant is a next door neighbor to Comtesse Panisse, and the contrast of coloring between the two has been much admired. Another very charming yellow rose is Grande Duchesse Adelaide de Luxembourg which, notwithstanding the inordinate length of its name, is well worth cultivating. Amazon is another very beautiful yellow rose.

I must remark, in conclusion, that the roof of the house is moveable, and is always taken off from June to September, thus affording a natural supply of air and of the rain of heaven during the hotter months of the year. All the roses are planted in the ground. Among them is a Marechal Niel growing on its own roots, which promises to finish the decoration of the western side of the rose-house.—"Gardeners' Magazine."

AN ENGLISH ROSE GARDEN.

The beds are of a size proportionate to the area of the garden, the dimensions being 48 feet in length by 18 feet in width, and they are divided longitudinally and laterally by grass alleys 10 feet wide. Each alley has at its southern end a bower of Roses, these bowers being 10 feet wide by 9 feet deep, and they are connected by a hedge formed by Laugworth Rambler, which, although not long planted, is growing vigorously, and producing a profusion of flowers. Along the grass alley and the outer row of beds are handsome pyramidal specimens of golden yews, which here take on a color of surpassing richness, and in the other alleys are pillars of Roses, which are very effective, and afford object lessons of much value. The herculean task which has been accomplished in forming this magnificent garden can only be fully appreciated by those who have had an opportunity of seeing it and know something of the food requirements of Roses. We are told by the exponents of rose culture to plant in deep holding loam, and better advice could not be given. But here the soil is extremely shallow and very light, and rests upon a solid bed of chalk of enormous thickness, and the fact was recognised at the commencement that to ensure any considerable degree of success it would be necessary to make the beds with soil from a distance. Consequently in their formation and the preparation of the stations for the pillars the few inches of soil on the surface was removed and put on one side, and the chalk excavated to a depth of 18 inches. Loam was carted in, and the beds made up with it and that removed from the surface. Farmyard and stable manure was mixed with the soil in considerable proportions, and this it need hardly be said has been liberally used since for mulching and as a top dressing. Were not every precaution taken to conserve the moisture and maintain

Malvern Rose Garden.

Mr. A H. Scarfe's Rose Garden.

Tea Rose.

the food supply it would be impossible to maintain in such soil the vigor for which the whole of the occupants of the beds are remarkable.

The pillars of Roses which so greatly enhance the general effect are well deserving of special mention, for they teach one or two lessons that are of much importance by reason of their having been learnt in the school of experience. Comparatively few of the Roses that are frequently recommended for pillars are, in Mr. Tate's opinion, suitable for the purpose. Some lack the requisite degree of vigor, others have a peculiarity of growth which renders it difficult to keep the pillars well furnished after having been planted a few years, while in the case of a few the flowering season is of too brief a duration. The best of the comparatively large number of varieties that have been subjected to a thorough trial here are, in Mr. Tate's opinion, Allister Stella Gray, a free-blooming noisette; Aimee Vibert, one of the oldest of the small flowered varieties of scandent habit; Reine Olga de Wurtemberg, one of the most effective of the strong growers, when at its best, as is the case here; Crimson and Longworth Ramblers, Myrianthes Renoncle, and Carmine Pillar. This is a small selection, but those who follow it will have no cause for regret. Three plants are used in the formation of each pillar, and the growths are trained to a framework formed with iron rods fixed at either end in a stout iron ring, that at the base being five feet or so in diameter, and that at the top about two feet. Means are, of course, provided for fixing the frames securely in the ground, and with reference to their form it may be said that by having them wider at the base than at the apex the whole of the plants is fully exposed to atmospheric influences. Some more pillars that are in process of formation have a still wider base than is here mentioned without any increase in the top ring, and the experiment is of much interest, it being of considerable practical importance to determine how wide an angle may be adopted while still retaining the pillar form. The arches or bowers are immensely attractive, as also is the pavilion, which forms such a conspicuous object, and these are chiefly clothed with the varieties mentioned as having been used in the formation of the pillars. The only additional variety is The Garland, a variety of great excellence; in some cases two varieties are trained over each arch or bower, and for draping the pavilion Crimson Rambler, Myrianthes Renoncle, and Aimee Vibert are employed.

The beds of exhibition Roses contain dwarfs, standards, and half-standards, each bed being limited to one form of tree, and some are wholly occupied by one variety, while others contain several varieties, but in all cases the several classes are kept distinct. Special note was made of a bed of standards of La France, because of the profusion and high quality of the flowers, and it may be mentioned in this connection that much finer blooms are obtained from standards and half-standards than dwarfs, A bed of Mrs. J. Laing was also very attractive, and some dozens of blooms might have been cut that would have rendered good service in a close competition. Large numbers of exhibition varieties are also grown near the kitchen garden, and in those quarters and in the Rose gardens were many superbly developed blooms of such fine varieties as Captain Hayward, Ulrich Brunner, Duchess of Albany, Gustave Piganeau, Dr. Sewell, Mrs. W. J. Grant, Margaret Boudet, Princess Beatrice (uncertain, but very fine when caught at its best), Madame Cusin, Madame Lambard, Anna Ollivier, Bridesmaid, Madame Cochet, Souvenir d'Elise Vardon, Mrs. Sharman Crawford, Gabriel Luizet, Fisher Holmes, Horace Vernet, Suzanne Marie Rodocanachi, Caroline Kuster, and Madame Hoste.

In the section of the Rose garden devoted to garden Roses straight lines have been avoided, and the beds are of varying forms and sizes and so disposed as to produce a picturesque effect. The beds are throughout of large size, and in the majority of cases the varieties occupying each bed is limited to two or three, the circles round which the several groups of beds radiate containing but one variety only. The beds alongside the central alley are chiefly filled with the rather tall growers, such as Rosa Mundi, remarkable for its bright, glossy, even foliage; R. rubrifolia, a purple-leaved species, so valuable for the supply of sprays of foliage for associating with the blooms of the teas in decorations; Bardou, Job, Allister, Stella Gray, Gustave Regis, Reine Olga de Wurtemberg, Moschata nivea, Thalia and Aglaia, two rambling Roses of great beauty, and Hebe's Lip. In other beds are glorious beds of Rosa Mundi, Augustine Guinoiseau, Fellenberg, Madame Alfred Carriere, Dr. Rouges, Mrs. Paul, Cramois, Ebloussant, L'Ideal, Madame Pierre Cochet, which may be described as a highly refined William Allen Richardson; Royal Scarlet, Bouquet d'Or, Rosa Pissardi, Madame Chedane Guinoiseau, Red Damask, Marquis de Balbainie, R. macrantha, one of the finest of the single Roses, Ma Capucin, Papa Gontier, Rainbow, Gloire des Rosomanes, Gloire Lyonnais, Boule de Neige, Grace Darling, Camoens, Madame Eugene Ressal, Beaute Inconstante, Celine Forestier, and Isabella Sprunt. Then of the small flowered Polyantha group, Mignonette, Anna Maria Mortravel, and Etoile d'Or were conspicuous by reason of the profusion of their flowers and pleasing colors.

There is no occasion for giving description of the varieties enumerated in the preceding paragraphs, for they are mostly well known, and the classes to which they belong and the colors can be readily ascertained by referring to a good trade catalogue. They are enumerated because of their effectiveness when in bloom and continuity of flowering. Mr. Tate regards a perpetual habit as of prime importance in Roses especially grown for garden decoration, and has endeavored to limit the varieties in the section of the garden devoted to garden Roses to those which bloom during the greater part of the summer and autumn, and the names of those which have been found to give the best results can hardly fail to be useful.—"Gardeners' Magazine."

A NEW TYPE OF AMERICAN ROSE.

At the twentieth annual meeting of the Society of American Florists and Ornament Horticulturists, reported in the "Florists' Exchange," Mr. E. G. Hill read a paper upon "The Development of a new type of American roses," and his remarks upon hybridising are worth noting by Australian growers. He said:

There are a number of distinct species of roses that should, and no doubt will, be tried for hybridising; first, I would name Rosa rugosa. While this species might not give us texture of bloom, there could be no doubt but that its offspring would have disease-resisting foliage, and a probability of hardiness sufficient to withstand our winters. This should be tried persistently, using pollen from our best Hybrid Teas and Hybrid Perpetuals and teas, using the rugosa as the seed-bearing plant; and while it would require a long line of crossing and crossing back, I have little doubt but that from this source can finally be secured our coveted type which would supply our northern gardens with an ideal rose.

Bruant, Cochet, Muller, Wintzer, and others have made a start in this direction. We have Bruant's cross between rugosa and Niphetos, named Mme. Georges Bruant; this variety has the lengthened bud of Niphetos, showing distinctly the influence of the tea variety.

Blanc double de Courbet is a charming shrub for lawn decoration and a most promising subject for cross-fertilization; Conrad F. Meyer is a variety which has had transmitted much of the fulness and color of the male parent, which is said to be Gloire de Dijon. Atropurpurea, one of George Paul's hybrid rugosas, will furnish the dark tints in any color scheme devised or planned. Sir Thomas Tipton, an American hybrid, introduced by Conrad and Jones, is said to possess many excellent characteristics.

I mention the above, believing them to be the most useful of the rugosa hybrids and having made the most distinct breaks from rugosa proper.

Other rugosa hybrids are Philemon Cochet, Alice Aldrich, Belle Poitevine, Mme. Worth, Calocarpa, Rose Apples, Chedane Guinnoisseau, Christopher Cochet, and Pierre Leperdrieux, and these are not all. They are enumerated to show what has been done with this type, and as a reminder that the hybridist need not go back to the original, but can use some of the fine breaks already made.

I wish to reiterate the previous statement, that I firmly believe that immunity from the disease known as "black spot" must come through an infusion of rugosa blood, and I would further state that your essayist is not speaking from practical experience in the matter of crossing the present popular varieties of roses with the rugosas, as his efforts have been more largely made in trying to secure new sorts suitable for forcing under glass.

Other species of roses may offer as fruitful a field for the hybridist as the rugosa, and why not try what can be done with our native American species? The climbing prairie types were secured from this source, and they certainly possess hardiness in connection with a fair amount of fulness—two distinct qualities essential to the new type.

American hybridists have given us many charming Wichuraiana crosses, and fine results have crowned the efforts of Messrs. Van Fleet, Manda, Walsh, Perkins, and Dawson. The serious question often propounded is, "Are they hardy?" Sometimes they winter perfectly, and again an occasional season finds them killed back severely. Your essayist has not had long enough experience with outdoor-grown stock of Dorothy Perkins, The Farquhar, W. C. Egan, Manda's Triumph, and other Wichuraiana crosses to speak with certainty as to their hardiness, but he believes that it is affirmed of them by their raisers.

Crimson Rambler is at once the most unique and the most satisfactory rose grown in the northern half of our country; no other rose can dispute with it the right to a first place in general popularity with the American people, for porch and pillar purposes. The wide dissemination of the rose, its tremendous sale the present season, and the prospective demand for future planting, exceed that of any other rose introduced into American gardens.

Experiments at Richmond (Ind.) with this variety tend to strengthen the opinion that a few years will give us white, blush, and intermediate shades in this particularly interesting rose. To be sure, we have had Aglaia, Thalia, and Euphrosyne, but between these and Turner's Crimson Rambler there is a wide difference of character.

To secure the new type of garden rose outlined will necessitate careful, painstaking labor extending over a long period. One year or two will not bring it to us. It has taken a full third of a century to bring the hybrid tea to its present stage of development, it is a long stride from Antoine Verdier, Mlle. Bonnaire, and La France, to the family as it is composed to-day. It might be mentioned in passing that the three varieties named above were the result of accidental insect pollenization. The evolution of the hybrid tea class is mentioned simply to show that time and patience are prime factors in creating and perfecting a new type.

We, the members of this society, might earnestly question as to how we can best aid in a consummation so earnestly desired, so necessary to the widening popularity of the rose in our American gardens. Enthusiastic, personal effort must be the groundwork of the movement, which may be encouraged by the award of the society's medal to meritorious seedlings whose constitution and texture of bloom make them desirable additions to our outdoor roses. As indicated previously, the efforts at Richmond have all been made in the interest of winter-blooming sorts, and while this has been the aim, several very promising varieties, other than forcing sorts, have been produced, which are now being tested as garden varieties.

The florists of America have been notoriously lax as a profession, in their efforts to improve the rose, nearly all our finest varieties being of foreign origin, and while we may rightly covet the honor of producing something fine and grand, we have been exceedingly blameworthy in sanctioning the act which robbed an eminent French rosarian of his honors, when we allowed the renaming of Mme. Ferdinand Jamin, calling it American Beauty.

We have the genius and talent to produce an American type of rose if our members will but apply themselves to the task at hand. Shall we attempt this work, or shall we go on in the old way, trusting to luck and to the products of foreign skill to supply us with roses suitable for our own gardens and homes?

CARNATIONS, CLOVES, PICOTEES, AND PINKS.

By Alexis L. Holtze.

These flowers undoubtedly rank next to the floral queen, the Rose, in popularity. They have a great range of colors, and most of them are brilliant in hue. Amateurs should have this flower always with them, as nothing is more suitable for the buttonhole than a good Carnation backed by a little of its own foliage; and as cut flowers for various decoration purposes they are incomparable. Some people even prefer the spicy odor of the Clove Carnation to the less pronounced scent of the Rose. The Carnation genus is so extensive that it has been found convenient to divide it into sections and sub-sections. It is now a difficult thing to define the difference between Pinks, Picotees, and Carnations, as the frontier lines between the Picotee and Carnation kingdoms have, by intercrossing, become so uncertain that it requires an expert to assign many of the modern acquisitions to their proper sphere. However, broadly speaking, the chief difference between the Carnation and the Picotee is that the former has a ground color on which some other shade or tint is painted, so to say, in unequal stripes running from the centre to the outer edge, called by gardeners flaking, while the Picotee has a pure ground of white or yellow, the other tints being confined to the outer edge of the petals in either a broad band or a mere line of color of equal tint and breadth, sometimes radiating inwards. Carnations are classified as selfs, flakes, bizarres, tree, fancies, Margarets, Malmaison, and others. Selfs are composed of flowers of one uniform color throughout, without marks and without shadings. Among these will be found the very best for ordinary purposes, as they are generally free growers, hardy, and, as a rule, the most fragrant. Flakes are those which have the ground color of white or yellow, etc., striped lengthwise with one color only. Bizarres are those which have a pure ground as in the flakes, but marked and flaked by two or three colors. The edges of the petals of Carnations are smooth; those of the Pink are generally jagged or notched. Picotees, which are the hardiest, are only bordered with a narrow margin of some dark color, or spotted with very small and almost imperceptible dots. Picotees are also divided into light and heavy edged varieties. Pinks are distinct from the above in having what is commonly termed "eyes," which are for the most part dark, and sometimes have a zone of the same color as the eye midway between the base of the petals or eye and the edge. The Clove has a larger blossom, and emits a pungent and delicious odor. I have not yet exhausted the list of varieties into which these flowers are divided, for there is another branch of this family, a giant class, called, (from the name of the original variety, Souvenir de la Malmaison) the Malmaison Carnation, which calls forth general admiration. They are strongly clove scented, easily managed, free flowering, and form excellent subjects for the border or in beds by themselves. Souvenir de la Malmaison, the old favorite, is soft blush color, with blooms as large as a full-blown Rose, but the newer introduction, Princess of Wales (rose pink) is gradually but surely displacing it. Margarets are supposed to be hybrids between the Carnation and the Indian Pink (Dianthus sinensis). Though rarely out of flower, they are as a rule, deficient in substance and odor. Writing of Indian Pinks brings to my mind the Japanese Pinks (Danthus Hedwegii) a race of very large-flowering, brilliantly-colored, half-hardy annuals which everyone should grow, as they are useful alike for beds or borders and are lasting and effective as cut flowers. The name Dianthus signifies "Flower of the Gods." Criterion of a good Carnation.—The stem should be strong, tall, and erect, about 24 in. high. The flower stalks should be strong and elastic and of a proportionate height. The corolla, or flower, should be about 2 inches in diameter, not less, consisting of large, well-formed petals, but not too many to give it a crowded appearance, nor so few as to make it appear empty. These should be long, broad, and substantial, the largest on the outside and gradually decreasing in size to the centre. The petals should be regularly disposed and nearly flat, with edges free from notches, fringe, or indenture of any kind. The calyx should be about an inch in length, terminating with broad points. Whatever the colors may be they should be clear and distinct, and disposed in long, regular stripes, broadest at the margin of each petal and gradually becoming narrower as they approach the base of the petals and terminating in a fine point. However, of late these rules have been very much relaxed.—"Mount Barker Courier."

PRESERVING VARIOUS SEEDS FOR SOWING.

One of the mysteries which beginners meet with in the sowing of tree and shrub seeds is why there is so much more difficulty in raising seedlings from them than from vegetable or flower seeds. They obtain their supply of flower and vegetable seeds, sow them, and they grow. Let it be tree seeds, and the result is not as satisfactory. What quite different treatment is required in the preservation of tree seeds is well known to the nurserymen who have the handling of them. Take, for example, seeds with a pulpy covering, such as the holly, magnolia, silver thorn, cherry, and the like. This pulp needs being freed from the seeds as soon as can be after the seeds are ripe, and then the seed proper placed in moist earth or sown. At times the seeds, pulp on, are thrown into a heap to rot. This should not be, at least, not for any length of time. The chemical changes in decaying pulp act injuriously on the seeds, destroying them oftener than not. A soaking of the pulpy seeds for a day or so, to soften the outer covering, is well, to be followed by immediate washing. The sowing of the seeds, pulp on, is sometimes practised, but it is not to be recommended; getting the pulp off first is better.

It is an erroneous idea that so long as the pulp, or outer covering, is on the seeds they are in good condition for sowing. Possibly in some cases it may be so, but seeds so kept, say from autumn until spring, have not proved satisfactory subjects for sowing. After a good many years of experience with seeds, I consider the best of all ways to be the immediate cleaning away of the pulp, and the mixing of the seeds with damp earth until sown.

Many would think that such bony seeds as those of dogwood, cherry, plum, peach, and the like, would not lose vitality quickly; but they do, if not kept moist. The soaking of such seeds in water to bring them back to life is futile; if too much dried, they are done for.

In the case of the holly it is the custom in Europe to throw them in heaps mixed with soil, to rot the pulp; in these heaps they remain a year. The action of the soil on the seeds no doubt prevents injury from the decaying pulp, but it would be better to save the time ocupied in the rotting by washing it off after a few days' soaking in water.

The admonition must be given to preserve moist all seeds, excepting those of a coniferous nature, from the time they are gathered until sown. With many, and probably nearly all, the keeping of the seeds in a slightly moist building would answer; but it would not be the equal of mixing them with soil.

CULTIVATION OF THE PELARGONIUM.

By John Everest.

I will endeavor to jot down a few facts learned from my own experience. They are a valuable and hardy class of plant, and I think there is scarcely any one class so showy in its various colors or so interesting as a collection as these when in bloom. I class them together as Shows, Fancies, Small-flowering, and Regals. They all require about the same treatment in cultivation, but most of the Fancies are the easiest to manage; they are the most floriferous, but not so showy in themselves as the other varieties. To make it properly understood I think it best to begin with the soil. I consider that the soil best adapted for Pelargoniums should consist of one-third good turfy loam pulled in pieces; black soil or peat (being a substitute for leaf-mould); and one-third well-rotted cow manure, with a dash or two of chemical manure, which gives a rich healthy green look. When these are well mixed together the soil is ready for use. I do not use sand, as it is not wanted; and another reason is that the tender roots in working through sharp sand get bruised. There is this objection to sand, that the soil, being open, it requires so much more watering, which runs the strength out of it. Many gardeners are of opinion that one potting is sufficient, but I believe in second potting. Pick out nice sturdy young plants from the rooted cuttings in 4-in. pots, and for the first shift they should be put in 6-in. pots. See that the drainage is good before setting the plant in the pot; put in a little rough moss or cocoanut fibre on the drainage, then throw in some soil; cram down well, add a little more loose soil, and then set the plant in. It should be sufficiently below the rim of the pot to allow a layer of soil over the ball, leaving 1 in. for watering. A ramming-stick should be used, one end being flat and the other round and level. Palargoniums should be potted very firmly. The second shift should be into eight or nine inch pots, thoroughly clean, these being large enough to grow on a good plant. Use the same soil. Before placing in the plant throw in a handful of bonedust, as this is an excellent thing for bringing color in the flower. See that the plants are well ready for their potting up. They should not be left to get at all pot-bound; but if pot-bound separate the roots carefully with a pointed stick, so that the plant will not lose much time in getting a fresh start. After this potting good attention should be paid to the tying-out and stopping of the shoots. Short sticks can be used for a a time, and then a wire frame can be placed around the pot. If this is properly carried out, there are not many sorts which would require the knife much the next season. Smoke them once a week if there are any signs of fly.

Watering.—This is an important matter, and is not always properly managed. There are many bad effects caused through mistakes in watering. If over-watered plants become very sickly, and remain at a standstill for some time, and the foliage becomes spotted and unhealthy, some growers tap each pot with the knuckle, and it is astonishing how soon one gets used to the ring, and is enabled to tell whether the plant requires watering. White on the foliage is often caused by sudden changes, and by the water resting on the foliage when the sun is shining powerfully on the plants, or too strong manure water will have the same effect. Do not apply manure water for a week or so after freshly potting, especially when potted the first time. Care should be taken when plants are setting their bloom to be very sparing with manure water, as when hurried on in this stage the pips will turn yellow and drop, or when opened they will be deformed. When the plants are in bloom discontinue manure watering altogether, as the flowers will last much longer; syringing overhead once or twice a week late in the afternoon keeps the foliage clean and the pores open. Choose a dry day for syringing. The house most suitable for growing is a low span-roofed one; the plants being close to the glass, they can be grown dwarf. If beds or benches are not high enough for the plants they can be raised on pots, and also when coming into bloom can be lowered to draw the flower well above the foliage if required. Allow plenty air night and day.

Shading.—We cannot get all through the season without shading a little. There are different shades used—whitewash, tiffany, calico, &c. Calico with rollers is a good shade, as it can be worked to suit the weather. There is one great fault in using blinds on houses—they are rolled down flat on the glass, the circulation of air is stopped, and the glass becomes very hot and hurtful to the plants. I should recommend to have rollers mounted on a rod about 9 in. above the glass, giving space for air between the blind and the glass. After these plants go out of flower they can be turned outside. Choose rather a shady place for a few days, and then afterwards expose them in the sun, still giving them water. They are often neglected and dried off so suddenly that many die. Pelargoniums should be cut back early in March, and they are then ready for a new start. The cutting back should be done with care. Where they have been allowed to grow up rank shoots they have a hard struggle to break when they should be only 6 or 7 in. high. When a plant has been properly grown and tied out the knife need only be used to thin out and tip back shoots. This should be done when the wood is thoroughly ripe and the weather still and dry; put them in a shadehouse, and sprinkle lightly twice a day until they break nicely. Then they can be brought into the house, and will soon be ready for shaking out and fresh potting. The roots can be pruned back a little where they are strong. Pelargoniums are easily propagated by cuttings, and some of the weaker kinds of the Fancies are better grafted on the Show varieties. To make good plants this should be done after being cut down, when the sap is rising. There are many good points to consider if intending to show at exhibitions. Some sorts are not worthy, having a bad habit of growth or being shy in flowering. The pollen should be removed to keep the flower clean, and some gum dropped into the calyx to keep the petals from dropping.

GROWING PLANTS IN ROOMS.

Although it is proverbially lost trouble to argue upon matters of taste, no cultivated eye will do other than admit that the most charming form of every plant is that with which unaided Nature has endowed it in congenial habitats, where it can fully develop itself. Under such conditions we can see with what exquisite nicety all its parts have been shaped and adjusted to further the vital purposes of growth and reproduction, and by studying this, a profitable lesson may be learnt as to their better treatment under the artificial conditions of culture. It is far too often overlooked that it is not merely the flowers which Nature has rendered attractive, but that there is a subtle harmony between these and the foliage and general habits of the plant which renders the whole a thing of beauty. In foliage plants, especially such as are grown entirely for the charm of their leaves and general elegance, we see this element displayed, but in amateur hands it is but too frequently the case that an utter ignorance of the laws of growth leads to an equally utter marring of the natural grace. In rooms, for instance, the fact that all plants must perforce grow towards the light is totally ignored, and the window specimen is therefore constantly being twisted and turned to show its best side to the room, with the inevitable result of contorted foliage in its constant endeavors at impossible readjustment. Nature, hitherto, despite her marvellous inventiveness, has failed to produce swivel-rooted plants capable of revolving and presenting themselves to different points of the compass as the conventional pot plant is often forced to do by its owner. Although most of the hard and fast lines between animals and plants have been broken down by the biologist, we may still accept the fact that plants, as as rule, are fixtures, and this being so, the more we recognise it in culture, the less we are liable to err, and in point of fact the only way to grow a room plant well is to rigidly adhere to the rule of always keeping the same side towards the light, identifying such side by a mark or tally. We recently saw a robust specimen of Asplenium bulbiferum in a lady's window which resembled a Medusa's head, a tangle of snakes, rather than a graceful fern; and on enquiry we found some genius had told the lady that the proper way to make all-round plants was to turn them partly round once a day, which she had religiously done, with this inevitably weird effect. The unfolding young fronds, stiffening their stalks as they unrolled, had fixed each day's growth at a different angle, and as this affected not merely the main frond stalks, but also all the secondary ones, the final result may be conceived. One great and essential need for proper and graceful development of all plants is adequate room and light. It is perfectly true that in the struggle for existence under purely natural conditions few plants obtain unhindered elbow-room, and hence in this respect we may afford them under artificial, or garden, culture a great advantage over their wild prototypes. In the large majority of cases, however, we err in the opposite direction by crowding diverse plants even more closely together than Nature does, as the manured soil of a properly kept garden naturally induces a lusher growth. In the wild forest we may see many a monarch of the woods who, in the course of centuries, has made room for himself, but the traces of the struggle are plain enough in gnarled and twisted branches, and irregular extension, and we perceive that if we want to fully appreciate such a tree at its best, we must seek it standing in solitary state in some park where all essentials of growth exist, and none of the drawbacks of a constant struggle to obtain them.

AUSTRIAN BRIERS.

It must be extremely pleasant when wandering in the Tyrol or Austrian Alps to come across a large bush of the Austrian Brier, enwreathed in its rich golden or brilliant copper-colored, elegantly formed flowers; whether the bushes be bearing copper-colored or yellow flowers, or probably a mixture of the two, they possibly may be exceedingly beautiful. I have not explored these regions, but I have hunted roses in the Valois, and they have been disappointing, for they have not been so good as when under cultivation. So it is, probably, with the Austrian briers, the good soil and cultivation promotes the production of long shoots, which in the following year bear finely developed flowers to their whole length, as depicted in the accompanying illustration.

The secret of their successful growth is to encourage the development of the shoots which are produced after flowering. If the plants are so cultivated as to produce full-sized shoots and the proper ripening of the wood, then refrain from pruning the shoots back, but bend them over and cut out the two-year-old wood. They make pretty standards, as so well exemplified in many gardens, and under favorable conditions they bloom satisfactorily. They, however, are seen to the best advantage when standards are formed by running up shoots from dwarf plants, the slender stem lending grace to the tree. There is no special difficulty in the production of specimens of this kind, the chief point being, of course, to commence with a vigorous dwarf that will produce a comparatively strong shoot.

The flowers of the Austrian briers are single, and charming in color, one variety producing bright yellow flowers, while those of the other are bright coppery-orange. They bloom early in the season, and last for a fair length of time, and are then over. The late Lord Penzance used the copper-colored form in raising his sweet-brier hybrids, and succeeded in obtaining one or two very attractively-colored sweet-briers, but they do not equal the Austrian copper in brilliancy. There are two double forms, one being known as the Persian Yellow and the other as Harrison's Brier. They are both fairly double, and the last-named is rather the richest in color. Both are effective in cluster; rather beautiful as individual flowers. The Scotch Rosa spinoissima must be very closely allied to the Austrian briers, for the Double Yellow Scotch is very similar in appearance to Harrisoni. Its mid-Asian ally has flowered with me for the first time this season. This is known as Rosa Alberti, and is one of Mr. Albert Regel's introductions from the mid-Asian plateau.

The Orchard.

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OPERATIONS FOR NOVEMBER.

By W. J. Allen.

Up to the time of writing these notes the rainfall in many districts has been very light during the last two months, and there are very few places away from the coastal districts where the subsoil has had a thorough soaking. It therefore behoves the orchardist to give the cultivation of the soil every attention, in order to conserve as much as possible of the moisture which has already fallen, or may fall, if he hopes to see the fruit trees carry their crops to maturity.

Every orchardist should have the ploughing completed by this month, and the soil around the trees should have been well loosened up with either the fork-hoe or garden fork, thus putting this portion of the soil which cannot be worked with the cultivator into perfect condition.

All apple and pear trees should have a thorough spraying with either arsenite of soda or Paris green solution. If it is desired to add bluestone to the arsenite of soda solution, 3 lb. of bluestone may be dissolved in 1 gallon of hot water, and when thoroughly dissolved can be made up to 20 gallons by the addition of more water. Now take 1 pint of the stock solution and dilute to 20 gallons with water to which 3 lb. of fresh slaked lime has been added, and pour this into the bluestone mixture, thus making the whole up to 40 gallons.

The Paris green may be mixed as follows:—Mix 3 ounces of Paris green with a little water so as to bring it to a paste as in mixing mustard, and to this add 1 lb. of best quicklime; then dilute to 40, but if bluestone is to be added to this mixture it will be necessary to add 4 lb. of lime to the Paris green and dilute to only 20 gallons. This must then be poured into the 20 gallons in which the bluestone has been mixed. The lime-water and Paris green or arsenite of soda must be poured into the copper solution, and never the copper solution into the lime-water, etc.

I may state that the arsenite of soda mixed as above gave splendid results last year. Of course several applications are necessary to keep the moth in check. The trees must also be bandaged and all fallen fruit destroyed to obtain best results. If the copper sulphate is added to the above sprays it will assist in checking the ravages of apple-scab and any other fungus diseases which may be troublesome. It will be found that some varieties bloom earlier than others, and therefore it will be impossible to spray all trees at the same time.

At all times see that the solutions are thoroughly strained, so that they will not clog the spray-pump later on. In spraying, use as fine a nozzle as possible, the object being to cover the tree with as fine a mist as possible without having any of the solution running off.

All bandages should be removed and examined every ten days after the grubs have made their appearance, and all grubs and chrysalids destroyed by cutting them in halves with a sharp knife carried for the purpose.

If aphis has made its appearance on peach trees they should be sprayed with either nikoteen diluted, resin and soda wash, or blue-oil emulsion which has been diluted in the proportion of 1 gallon in 60.

Keep a strict watch on all refills, and if these show any signs of wilting give them one or two buckets of water from time to time until they get a good start.

Disbud all newly-planted trees, leaving good shoots at least four inches apart along the trunk of the tree, and do not allow two or three shoots to start from the same place, as so many have done, but give each branch a separate hold of the main stem.

Citrus trees may be successfully budded this month. Keep all dormant buds and grafts well disbudded, so that the bud may get away good and strong. No suckers or shoots should be allowed to grow below the buds. It is also very essential that stocks should be cut back properly. The cut should be slanting, being slightly lower on the side opposite to the bud, and it is advisable to stake them, not only to prevent their being blown out, but to encourage a straight trunk.

Where grafts have been put in old trees they are even more liable to be blown off than small ones, and must be tied to prevent it. To do this a good stake should be tied to the branch grafted, and allowed to project a foot or more over the end; then as the graft grows it can be tied to it.

While working around trees watch for borers on the trunks and branches, as when they are starting their work it is very easy to cut away the bark and find them, in this way keeping the orchard free of this pest.

In coastal districts it is well to spray vines immediately after the fruit is set with Bordeaux mixture, and should caterpillars of any kind be eating the leaves, add Paris green to the solution in the proportion of 1 oz, to 20 gallons. Repeat the sulphuring from time to time, giving as many as eight applications if the season is at all damp. This will pretty well keep the oidium in check.

Keep all vines well disbudded. I have noticed in many small vineyards that this important work is neglected. Never allow any branch to grow below the crown of the vine. To do the work properly it will be necessary to disbud all vines from two to three inches —N.S.W. Agricultural Gazette

Vegetable Garden.

OPERATIONS FOR NOVEMBER.

By W. S. Campbell.

The season, so far, at time of writing, seems to be late and very dry over a considerable extent of country, with a satisfactory rainfall, however, many kinds of vegetables, such as pumpkins, marrows, melons, and cucumbers, which are practically at a standstill through want of moisture will grow with great rapidity and make up for lost time.

The use of farmyard manure will be found satisfactory as a mulch for any kind of vegetables. It may be spread quite thick and will then be most effective. With a little practice, and a good, not too broad, Dutch hoe, any weeds which may come up in the mulch may be destroyed without much disturbance of the mulch. It should not be difficult on a farm to obtain all the necessary manure for the mulch, but if for any reason or other it is not practicable to spread the mulch, the surface soil amongst and about the vegetables should be frequently stirred, and this should check excessive evaporation from the soil and save the vegetables to a great extent.

Seedling vegetables which have been grown for planting will need watering frequently during the dry weather, and it may be desirable to shade them during the day, or a part of the day, with some very thin or light shading.

Beans of the French or Kidney type.—These beans, of which there are now a good many kinds, may be grown in almost any part of the State. Whenever this vegetable has been growing satisfactorily, further sowings may be made from time to time in order to keep going a supply of beans sufficient for all requirements. A few trials show about how much land to sow at a time. If the plants are well cared for, in good health, and the beans picked frequently so as not to allow any to ripen, they should produce beans for some weeks. Runner beans will be found useful and prolific, and sometimes they are to be preferred to the dwarf. If well staked or sticked they may serve to some extent as a breakwind for other vegetables.

Broad Beans.—These should be bearing in cool climates, and, perhaps, in other places, but it is too late to sow except in quite cool districts where the rainfall is good.

Beans (Lima).—Either the dwarf or runner varieties may be sown during the month.

Beet (Red).—Sow a little seed once or twice, or as often as may be required during the month. As a rule not a very large supply is needed. The globe varieties will be found to be the most satisfactory. Sow in drills about 18 in. apart, and thin out seedlings well as soon as they are large enough to grow singly.

Beet (Silver).—Seed may be sown if any plants are required; but if any plants had been raised last month and planted out they will probably suffice for some time to come. This vegetable is a very useful one, for it will provide good supplies for a long time if well grown, and it is well supplied with manure. Avoid pulling many leaves from a plant at a time and fresh ones will soon grow, if the season is favorable, or if a good supply of water is available for the vegetable garden.

Cabbage.—A little seed may be sown now and then during the month to keep up a supply of young plants for pricking out, and afterwards for planting out in the garden. A little shading over the seedbed is desirable, and also a light mulch of well broken up manure, and frequent waterings will be necessary so that the seed after sowing does not become dry. Plant out strong young cabbages whenever the weather is favorable and the soil is in good condition. Use abundance of farmyard manure and mulch well.

Cauliflower may be treated just the same as the cabbage.

Carrot.—Sow a little seed in rows about 1 foot or 18 inches apart.

Celery.—Sow a little seed to keep up a supply of plants. Transplant any advanced plants which may be large enough to heavily-manured ground which has been well prepared for their reception. If some of the self-blanching plants are used a good deal of work in blanching may be avoided. Some shading will be necessary, but not so much as for the green-stemmed varieties.

Celeriac, or turnip-rooted celery, is a useful kind of celery, used for the root and cooking purposes chiefly. Sow a few seeds in a seedbed, and transplant like ordinary celery. No blanching will be necessary.

Cucumber.—Seed may be sown early in the month in well-dug, well-drained, and well-manured ground. It would be advisable to manure the whole of the ground, and not merely portions where the seed is to be sown. As the plants grow, pinch any shoots which are likely to make strong growth.

Cress and Mustard.—Sow a little seed occasionally. This is a useful salad and makes an excellent addition to lettuce and other salad plants. Use plenty of well-rotted good manure, and endeavour to induce quick, crisp growth. Watering may be necessary frequently should the weather prove dry.

Capsicum —A plant or two should suffice in the vegetable garden, for, as a rule, this vegetable is not required to any great extent. The small varieties are useful for pickling in vinegar to make what is known as chili vinegar, and the medium-sized for mixing with onions when pickled. The very largest kind are used for canaries as a relish. Seed may be sown and the seedlings afterwards transplanted to well-manured soil.

Egg-plant.—Seed may be sown in seedbed, box, or seedpan. Plants already raised may be planted out in the garden on well-prepared ground.

Kohl-rabi, or turnip-rooted cabbage, is worth a trial. A little seed may be sown, and well-advanced seedlings planted out like cabbage. Manure the ground heavily if good results are desired.

Leek.—The ground for this vegetable needs to be very heavily manured. Seed may be sown occasionally in seedbed, and seedling leeks may be transplanted from time to time in shallow trenches. Should the weather be dry, a good deal of water will be necessary to keep the leeks growing as they should.

Lettuce.—This salad plant is generally highly appreciated in summer, when it is more difficult to grow than in cooler weather. It has a greater tendency to run to seed than to form good solid heads, especially those lettuces which are transplanted. To obviate this running to seed, or "bolting," the seed may be sown in rows where the lettuces are to grow. The soil should be well manured and well dug. It may be advisable to supply the lettuces occasionally with liquid manure to induce quick growth. Make use of the plants as soon as possible, and do not wait for the chance of their "bolting."

Parsnip.—Sow a little seed in rows about two feet apart. The ground should be dug deep and well. The application of manure

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The Flower Garden

OPERATIONS FOR DECEMBER.

By J. Cronin.

Many herbaceous, shrubby, and bulbous plants that bloom during the autumn months may be planted in November and December, including Dahlias, Salvias, Delphiniums, Gladioli, &c.

If Chrysanthemums have not yet been planted into their flowering quarters such planting should be done at once. Plants from pots may be put out, cloudy or showery days being most suitable for the purpose. If the soil has been well worked and manured good results may be reasonably expected. When specially fine blooms are desired, from three to six shoots should be selected after the plants break into lateral growth, each shoot being staked, and all other growths removed as they appear.

Dahlias may be planted as late as mid-January when young struck plants grown in pots are procurable. The best results are usually obtained in the metropolitan district from planting about new year. In later districts, and where frosts are likely to occur during April, they should be planted a fortnight earlier. Dry tubers should be planted two or three weeks earlier than rooted plants from pots.

The Dahlia needs a free soil, liberally manured, the addition of charcoal, wood ashes, or rough litter being advisable if the soil is of a heavy close nature. The Cactus type is greatly to be preferred to the old show varieties, and is becoming more popular each season, owing to the many improved varieties that are being annually distributed.

Of Salvias, Bonfire is probably the best variety for mixed groups or borders, or for planting in masses, being of dwarf habit and producing in summer and autumn abundance of bright scarlet flowers. Bethelii, the flowers of which are rosy-pink, tipped with white, growing to a height of 4 ft., is another kind worthy of general cultivation in mixed borders. Salvia patens, a dwarf growing herbaceous kind, is one of the finest blue flowering plants in eixstence.

Many of the recent hybrids of Gladioli are a decided improvement on the older garden varieties, and are probably the finest summer flowering bulbous plants. Childsii, Lemoinei, and the Butterfly sections are particularly fine. A batch of bulbs may be planted now for autumn blooming. The soil for Gladiolus should be deeply worked and manured, well decayed stable manure being the best.

Delphinium formosum and its hybrids are beautiful herbaceous plants producing long spikes of flowers of various shades of blue. They bloom freely during summer and autumn, requiring fairly rich soil, and water during dry weather. They should be planted at once.

Various bedding plants, such as Alternanthera, Iresine, shrubby Begonias, &c., should also be planted as soon as possible.

Lotus peliorhynchus, a glaucous leaved trailing shrub, producing scarlet flowers, pea shaped, is a specially desirable plant for rock work or hanging baskets, &c. It is quite hardy, and rapid in growth, blooming profusely in early spring.

Where Roses are attacked by aphis the plants should be throughly sprayed with a tobacco wash. "Nikoteen" is the best of the many preparations offered for sale against insects of this class.

If mildew appears the plants should be thoroughly sprinkled with flowers of sulphur, early morning being the proper time for such application.

Daffodils and other spring flowering bulbs that require to be lifted, should be so treated as soon as the tops have died off.

WHEN PLANTS DO NOT GROW.

It is quite a common request that "I would like so-and-so grown in a certain part of the garden, such as Sweet Peas at a certain entrance door, or on a certain border. They have been grown there for many years; they look so well there, for although they have not done so well as formerly, at the same time I like to see them there and would like you to bestow some attention upon them." Experience, however, has frequently proved that, no matter how good the cultivation may be as regards tillage, manure, and after attention, it must be admitted that Sweet Peas and many other similar subjects never do so well as when they are sown or planted in fresh ground. Here, says one gardener, I have two doorways from the flower garden into the kitchen garden. Sweet Peas are regularly grown on both sides of each door, and I could learn that they had not been a great success for some years previous to 1900. In that autumn I had the soil where they were to grow taken out to a depth of about 20 in., and about as much in breadth. This was wheeled on to a vegetable break, and the trenches were refilled with soil from the vegetable break; in fact, it was simply an exchange of soil. The result proved eminently satisfactory, and its annual repetition has been attended with equally good results. Considering the many disappointments with Mignonette and other seed not germinating freely, or Roses whose growth is not all that could be desired, it well repays the labor, which, after all, is not a serious one, as it simply means loading the wheelbarrow for two journeys. Mignonette is another favorite plant, and is frequently sown by garden entrances; indeed, no finer subject could be desired for such a position, and if the same method be adopted as with the Sweet Peas, it will be found that no plant responds to fresh soil more readily than does Mignonette. Turning to plants of a permanent nature—for example, Roses—it has been found advantageous to place fresh soil round their roots when beating up old borders, and, when replanting whole borders of Rose trees, it is the most satisfactory plan to exchange the soil, if this is at all practicable. Here a border occupied by Hybrid Tea Roses was subjected to the treatment recommended for the Sweet Pea borders, and it is at the present moment one of the features of the garden. About three years ago my employers intimated to me that they would like Hybrid Tea Roses in this particular border, but they had been planted twice and had refused to grow. Accordingly a similar mode of treatment was adopted. The soil was wheeled away to a depth of 24 in., the bottom well broken up, and the trench refilled with soil from the vegetable quarters. Naturally, this was a heavier undertaking; but there again any extra labor has been amply recompensed by the production of many large and fine rose blooms of various shades of color.

A ROSE-COLORED BORDER.

All shades of rose color can be obtained with Shirley Poppies, Salmon Queen Clarkia, Phlox (different shades), Malope grandiflora, Pink Lavatera, and Snapdragons. At the end of a walk the color scheme is completed by a Crimson Rambler Rose, trained to cover an arch over the entrance gate. The Salmon Queen Clarkia is one of the most useful annuals, not only for massing in the border, but also for cutting. I did the dinner table not long ago with long sprays of the Clarkia and Shirley Poppies of exactly the same shade. I also have a long bed in the same garden with Sweet Peas (in separate colors), in a zigzag ribbon pattern, and Cactus Dahlias in the spaces. I wonder if the Sweet Peas are as fine everywhere as they are here this year. A great many of the flowers have four blooms, and I have even found five.—CONSTANT READER.

HARDY FLOWERS.

BY L..

HEUCHERA SANGUINEA.—As a weatherproof flower this has few equals. The flowers seem to be quite indifferent to atmospheric changes, periods of great heat and heavy rains not dimming their brightness. The best way to utilise this Heuchera is to plant in colonies of from three to a score of plants, as in this way its decorative worth is better realised. A top-dressing of leaf-mould or rotten manure applied in early spring will impart vigor, and so give strength to the flower spikes and color to the blooms. There are some inferior varieties of this plant in cultivation. They have probably been raised from seeds and give no true idea of the worth of this Heuchera, the flowers being very poor in color. The best form of it is splendens, which has very bright flowers, and there is another form called robusta. which is much stronger than the type.

SAXIFRAGA HAWORTHI.—I am not aware if this Saxifrage is grown under any other name in this country. Up to the present I have failed to find it in any English catalogue of hardy flowers. I got my plant from Holland, where this species has apparently been grown under the present name for a considerable period. I find, however, that in the case of alpines the Dutch nomenclature is not very reliable; one is apt to get the same thing under several different names from different firms. Whatever the true name of Saxifraga Haworthi may be, it is a gem among rock plants, and certainly the best of the mossy section. It forms cushions of rather pale green verdure, about 6 inches high, the growth being densely packed and somewhat rounded at the top. As is the case with the Saxifrages generally, the young growths take on a brownish tinge in summer. The pure white flowers are produced in such profusion as to smother the plants; in fact, I know of no other member of this large and varied family that can compare with it for freedom of flowering. As a pot plant for cool rooms or window ledges it should have great value by reason of its delightful verdure; it is attractive all the year round.

MONTBRETIAS.—Now that the fine hybrid forms raised by M. Lemoine can be had at prices that place them within the reach of flower growers generally, we shall probably see but little of the old crocosmiæflora and Pottsi, from which they are derived. The newer kinds are, according to my experience, as free flowering as the typical forms, and although some of them are dwarfer in habit, they are all sufficiently vigorous to give a good display in the open ground. Such kinds as Phare, Etoile de Feu, and Pottsi grandiflora are very brilliant, and in Drap d'Or, Pluie d'Or, Aurea, Solfaterre, &c., we get very pleasing and uncommon shades of chrome, orange, and yellow. Some kinds, such as Tigridie, are beautifully spotted. By reason of their graceful growth and fine colors, these Montbretias are distinct from all other hardy flowers, and now that they are sufficiently cheap to be within the compass of the modest purse they will undoubtedly find a place in gardens large and small. I should wish, however, to warn intending growers that except in the very warmest parts these fine hybrid forms cannot with safety be left in the open ground all the year through without protection. It is when the ground becomes cold to a depth of 6 in. that they suffer, and are either killed outright or are so weakened that their blooming capacity is destroyed for the coming season. Either the bulbs should be protected in some way or they should be lifted and stored away in some cool place. These Montbretias make fine pot plants, putting three good bulbs in a 6-in. pot.

THE PETUNIA AND ITS CULTIVATION.

BY MR. J. BEGGS.

This is one of our best florist flowers, and has many points to recommend it. It is easily cultivated by amateur gardeners, can be had in flower eight or nine months of the year, is good for pot culture, has a nice perfume, and, above all, it can be bedded out through our hottest summers, forming a mass of rich colors which is rarely exceeded by any other flower.

HYBRIDISING.

There is no denying this is one of the most important parts in the cultivation of florist flowers, for without the aid of the hybridiser it would have been impossible to see flowers in their present state of perfection. The best time to do this is between nine and one on a warm day, as the flowers have the greatest amount of vigor in them at that time. The flowers should be of nearly the same age; if not, there is a tendency to throw back to the original. The flower that is to be operated upon should have the anthers taken from it before being quite open, so as to prevent self-fertilization. Some judgment is required in the selection of the plants, for very often a weak-constituted plant produces the best flowers (especially in doubles); his aim is then to cross on to a robust-growing kind. In the matter of the colors of flowers they ought to be clean and distinct; also even shapes should be used. The next thing is to tie a piece of twine round the bottom of flower, and when the seed vessel has turned brown the seed is ready for gathering.

Soil.

It is well not to have any set rule in the quantities of soils to be used, such as two-thirds of one kind, quarter of another, and so on. The principal thing is to get the body first, which should be composed chiefly of good virgin loam of a sandy nature, using some cow manure three to four years old, peat, plenty of sand, and some burnt ashes from a rubbish heap, the whole to be well mixed. Leaf-mould is preferable to peat, but is not always to be had.

Seed Sowing.

If for greenhouse culture the first sowing should be made in the first week of April, making the soil much lighter than used for potting. A seed pan or shallow box is best for sowing in; well drain it, fill to top with soil, make surface firm and smooth by pressing soil down with bottom of a pot, after which put pan or box in some vessel up to the brim in water, to soak soil. Sow thinly, barely cover with soil, then put a pane of glass over top and keep in shade. When the seeds have germinated remove the glass by degrees, but do not allow the soil to get dry. If water is required use a small syringe, because this does not allow the water to fall so heavily as to wash plants out of soil.

Potting.

In the first place, the pots should be thoroughly clean. Dirty pots are very often the cause of plants becoming unhealthy. Good drainage is essential to the plant; in fact, it is half the battle in growing any plant. First place a piece of concave pot over the hole, then some rough pieces of pots or bricks, and a few smaller pieces over these, covering all with some of the lumps that usually fall to the bottom of potting soil. Over-potting is to be avoided in this and many other plants, as the soil is liable to become sour before the roots can come through the ball, so advise small shifts. When the seedlings are fit to handle place them in two and a half inch pots, leaving the necks of plants clear of soil, which should be fairly dry. As soon as the roots are showing all round the ball shift into four-inch pots, potting moderately firm; but before doing this cut the point of central shoot out to make them stool or throw side-shoots, and this should be continued until they are in their flowering pots. By this means bushy plants are obtained. They should be kept close to the glass, as otherwise they are inclined to run leggy. Plenty of light and air is essential. Pot again into five and six inch pots, which will be large enough for flowering in (unless large specimens are wanted). When in these pots the shoots should be staked out individually, to form a well-shaped plant; the sticks to be thin, and kept out of sight as much as possible.

Watering and Liquid Manure.

Although the Petunia can withstand great drought, it likes moisture during the summer months, also occasional supplies of liquid manure, more so when confined in pots. Small doses, and often, is better than too much at one time. The best and safest manure to make liquid from is fresh cow-yard, but change of food is as beneficial to plants as to animals. Sulphate of ammonia is a good artificial manure, commencing from one quarter up to one teaspoonful to the gallon of water; but this must not be continued for any length of time, say, once a week for two or three weeks, then change to soot-water, cow manure, or Peruvian guano, which should be used in a dry state, putting a five or six inch potful to an ordinary barrowload of fine soil, and applying to the top of pots after taking away a little of the top soil. Liquid manure is not required till the pots are filled with roots.

Cuttings.

The best time to strike these is in spring or early summer; the wood is then fresh and full of vigor. If small side-shoots cannot be had, a part of the plant should be cut back, and after two or three weeks the breaks will be ready to take off, when they may be put round the sides of pots or pans, in very sandy soil, then cover with some glass, keep close and shaded from bright sunshine, and in about a fortnight to three weeks they will have rooted; pot into two and a half inch pots, and treat as seedlings. Cuttings of flowering branches or old wood should never be used, as these will never make good plants. Seedlings are preferable to cuttings, as they are generally more robust than plants raised in this way. In perpetuating named or good kinds, cuttings ought to be taken often during summer months, so as to have young plants in stock. The old ones sometimes turn yellow, and are not fit for cuttings if left in pots through the winter.

Diseases and Insect Pests.

Of all the florist flowers the Petunia is the least attacked by disease, and this ought to be considered another point in favor of its more general cultivation. It sometimes happens that an old plant gets attacked by a rust or fungus if kept too wet. If we had nothing more than this to contend with, there would be little cause of complaint, but the slug, the snail, and, worse than these, the sparrow, have the greatest liking for the Petunia. One remedy for the slug is to get some lime, and air-slack it before using; put some into a small flourbag, and shake over the ground, about 8 in the evening. If a few particles of dust get on the slug it will kill it. The surest way is to hand pick this and the snail for a few nights. In regard to the sparrow nuisance, it is a difficult matter to find a remedy. It is only while the plants are young that anything is to be feared from these pests.

Planting Out.

July and August is soon enough to sow seed for outdoor planting. When the seedlings are strong enough they may be pricked out in shallow boxes four inches part, in sandy loam, and when nice plants, shift with a ball of soil to their flowering quarters, in sandy loam, enriched with rotten manure. Pinch the points of the shoots out as the plants grow, and mulch the ground to keep the sun from roots; also pick off decaying flowers, thereby inducing others to take their places. Little attention is now required, except to give water and occasional doses of liquid manure. After they have been flowering some time, one part of the plant should be cut back to within six inches of the roots, and when the young wood has grown three or four inches the other part is to be cut in the same way; by this means the flowers are produced on young wood again.

In closing this paper it will be noticed much stress is laid in the matter of hybridising, and although a great deal has been done by amateurs, it is to be hoped that they will still continue to take a greater interest in this part of cultivation. Not only do they raise their own seeds, but look forward to getting something superior to the original; and if not successful, there is not the same amount of disappointment as if the plants or seeds were bought elsewhere. Again, it is an inducement to amateurs to love floriculture, which is considered the most healthy of recreations. There is one other point, and that is never to throw away the smallest seedlings in Petunias, and a great many other florist flowers, as they invariably turn out the best, but a great many people would disregard this, and choose large plants, thinking they had more for their money.

CULTIVATION OF THE ROSE.

By Mr. E. Smith.

The Rose has been elected from hundreds of thousands of beauties from all parts of the globe by universal consent the queen of flowers, and well she deserves the title. It has not only been appreciated at all times, but in all climes, and is found in every quarter of the globe—in deserts, in glaciers, on mountains, in marshes, forests, valleys, and on plains. That our climate is well adapted for the cultivation of the Rose may be seen by the splendid displays at our Shows. At a Show held in Adelaide in October, 1869, the Duke of Edinburgh was present, and stated that he had never seen a finer display of flowers at any of the Rose Shows held in England. Well, to obtain good Roses you must cultivate them, and I will endeavor to give in as concise a form as possible my experience and practice. I will therefore begin with

Soil and Situation.

I know of no soil but what the Rose will grow in with the exception of drift sand and soil that contains salt or magnesia, but the best of all is a strong alluvial loam inclining to clay; it also grows well in heavy calcareous clays. Care, however, should be taken in such soils to drain when water is likely to lie on or near the surface. Still, any deep soil, with a cool subsoil, suits them well. A light surface soil, with limestone or sand beneath, will grow good Roses, with an abundance of manure on the surface, and dug in annually, but any ordinary garden soil will grow them to perfection if properly cared for.

In choosing a situation for a rosery on a large scale let it be well open, so that the plants may always have a free current of air. An open field is suitable for them, sheltered round with a hedge of some sort; and the Dog Rose, Boursault, and Sweet Briar are well adapted for such a purpose; so that you may have all Roses, or Roses to shelter Roses, on a small scale. They do well planted in double or single rows by the sides of walks, in open beds, or on lawns, &c. Some people plant their Roses under some tree or shrub, and wonder why they do not come to perfection. They will not stand such a situation, for the reason that they are robbed of their soil or food by the roots of the tree under which they are planted, and also by the want of a free current of air. I say give to the Queen of Flowers the best situation at command, and you will be rewarded by her beauty.

Propagation by Seed.

The hips of all varieties will be ripe in May or the beginning of June. They should then be gathered and kept entire in a flower pot filled with dry sand, carefully guarded from mice. In August they should be broken to pieces by hand, and sown in beds, boxes, or seed-pans, the latter two not too shallow—say from eight to nine inches deep. Use a rich compost of rotten manure, loam, or peat, with plenty of sand, or an equal part of each of the above. Cover the seeds to the depth of about half an inch. If in a bed, the same compost may be worked in near the surface. After sowing, let the beds or boxes be exposed to light and air, watering when necessary, and shading on very hot days. The seeds will germinate and show themselves in September. When they have formed three or four leaves, exclusive of their seed leaves, they may be carefully raised, put into small pots, placed in a frame or pit, and shaded when necessary. If they are wanting to flower early they may be repotted in larger pots to grow them on, and in some cases they will flower the following season.

Our climate being so well adapted to the Rose's seed-bearing capability ought to produce some extra fine varieties if care is taken in hybridising. It requires some watchfulness to do this at the proper time; if too soon, the petals will be injured in forcing them open; and in the hot weather in September and October, if delayed only an hour or two, the anthers will be found to have shed their pollen. In order to ascertain precisely when the pollen is in a fit state for transmission, a few of the anthers should be gently pressed with the finger and thumb. If the yellow dust adheres to them the operation may be performed. It requires close examination and some practise to know when the flower to be operated on is in a fit state to receive the pollen. As a rule the flowers ought to be in the same state of expansion, or, in other words, about the same age. A camel's hair brush is almost the best thing to take the pollen from one flower to another with, the hybridiser selecting the varieties he wishes to operate on. I wish some of our amateurs would take the work in hand, as I am sure they would be well repaid for their trouble.

Propagation of Roses.

There are four other methods of propagation applicable to Roses besides by seed, viz., by layers, cuttings, grafting, and budding.

Propagation by Layering is very useful with some varieties, such as Noisettes, Tea-scented, and other climbers, as some are difficult to strike from cuttings unless under very favorable circumstances. About the middle of November the shoots will be about 18 inches to 30 inches in length. From these the leaves should be cut off close to the shoot with a very sharp knife, beginning at the base to about two-thirds of the length of the shoot. The shoot must then be brought to the ground, so as to be able to judge in what place the hole must be made to receive it. This may be made large enough to hold a small quantity of compost of rotten manure and sharp sand in equal quantities, well mixed. The shoot must then be tongued—that is, the knife introduced just below a bud, and brought upwards so as to cut about halfway through. This must be done at the back of the shoot, not by any means in the front or in the bend, so that the tongue does not close. To make certain of this a small piece of stick may be introduced to keep it open. Much nicety is required to have the tongue at the upper end of the shoot, so as not to be in the part which forms the bend or bow, as it is of consequence that it should be within three or four inches of the surface. The tongued part must be placed in the centre of the compost, and a moderate-sized stone placed on the surface of the ground to keep the layer in its place. They should be watered in the summer, and will be ready to dig up in the following June.

Propagation by Grafting.—There are many ways of grafting Roses. The most eligible is the common whip grafting; but I have not found grafting suitable for this climate. It is far too tedious as compared with budding, and does not produce such good results.

Propagation by Cuttings.—Cuttings should be planted in May and June. Suppose the cuttings to be from eight to ten inches long. All the leaves may be removed from the lower end—that is, the end which is to be put in the ground. Cut at just under the bud with a sharp knife square, or a little on the slant. Prepare a bed or border of good free soil. If at all inclined to clay, put some sharp sand at the bottom of the trench, which will materially assist them in making roots. Plant the cuttings two-thirds under the ground, and water them well during the hot season. Some varieties root much more freely than others, and on the plains failures are very frequent. The hills are more suitable, especially in some of the gullies, where water is near the surface.

Propagation by Budding.—This system I have found to be far preferable to any other. Cuttings, even if successful, take at least two years to make fair plants; by budding a good plant may be obtained in four months, provided that the stocks are in a healthy state. The operation of budding is very easy to do, but difficult to describe. However, I will endeavor to describe it. A longitudinal cut, not so deep as to penetrate into the wood, but merely through the bark, should be made in the clear part of the shoots, thus |; then a transverse cut, thus —, at the top of the incision. It will then look thus T. The bark on both sides of the incision must be opened with the flat handle with which the budding knife is provided, and the bud inserted. Some recommend the thin piece of wood adhering to the bud to be left in. I always take it out. I have found from experience that the buds are not so liable to be blown off if the wood is taken out. To simplify this matter, take a rose shoot with its buds, cut off the leaves, leaving the footstalks about an inch in length, and then cut off a very thin slice of bark about an inch long, which should have a bud in the centre. This slice of bark will have a layer of thin wood inside, which should be carefully removed. The bud should then be inserted, commencing at the transverse cut, and thrust gently down. When the bud is inserted cut off with your knife a piece from the upper end of the plate—that is, the piece of bark with the bud attached—so that it fits closely to the transverse cut; then bind it up firmly, but leave the bud showing out, with cotton twist. Budding may be commenced in November and performed as late as the latter end of March. In about three weeks after budding the ligatures may be removed. All the branches not budded must be cut off from the stock cleanly about the time the ligatures are removed, and the budded shoots shortened to within two or three eyes of the inserted bud. This management of budding Roses is applicable to standards of all heights as well as dwarfs. Of stocks for budding on there are several kinds used—the Manetta, Sweet Briar, Banksia, Dog Rose, &c. I find the Dog Rose to be the very best for this climate, struck from cuttings from one to four feet in length, and from half an inch to one inch in diameter, taking care to cut off all eyes at the bottom to prevent suckers, which are always a trouble.

Cultivation and Pruning.—All classes of Roses delight in soil well manured. They will stand a good dressing of well-prepared stable manure twice in the season, viz., one in the autumn—say in May—as a surface dressing. Let it remain on the surface until the latter end of August, when it should be forked in; bonedust may be used with it to advantage. Fork over the ground again about the middle of September, after which give your plants a good thick coat of mulching of moderately rough stable manure. This will keep the soil cool and damp, thus saving watering for-some time. Stable manure, if thought to look unsightly, should be lightly covered with earth, just sufficient to cover the roughness of it.

Pruning should be done at various times in the season, and the separate classes of Roses require different ways of pruning. There are winter and summer prunings. Hybrid Perpetuals.—The winter pruning should be done in June as a rule. Two-thirds of the preceding summer's growth may be cut off, taking care to give the plants an equal balance of shoots, so as to form a good head, whether it be standard, half-standard, or dwarf. In some varieties of Hybrid Perpetuals which make very long shoots, such as Francois Arago, Francois Lacharme, Duke of Edinburgh, and several others that are of a pendulous habit, nearly the whole of the shoot may be left. You will then have a fine racime of flowers the whole length of the shoot—not that you will get such large show flowers as by the former system, but the effect is grand. Summer pruning should be done as soon as the flowers drop. Cut down to one or two buds under the flowering heads; they will then make young wood, and flower again in a short time. All weak and useless wood should be cut out to give the plant plenty of air. I am an advocate for disbudding, as being the best calculated to produce flowers of the finest possible condition; it keeps the plant in full health and vigor, and brings it to the highest state of beauty. It has been successfully applied in the cultivation of other trees, and why should it not answer equally as well with the Rose. The latter part of August or early in September is about the time to do it, or when the buds or young shoots are from one to two inches long. There are always too many shoots produced. To obtain fine foliage and flowers, in some cases half, in others two-thirds, of the buds may be removed, according to the variety and strength of the plant to be operated on. It takes but a short time to do it, and when pruning time comes round there is very little work for the knife; if the roots are well adjusted, with few exceptions there is only to shorten them. Climbing Roses, such as Cloth of Gold, Gloire de Dijon, Boursaults, Banksias, and others of a similar character require a different mode of pruning to the Hybrid Perpetuals; and all Summer Roses, whether they are trained to a wall trellis, or budded on tall standards so as to form a dome, which has a very fine effect, the dead, weak, and useless wood should be cut out, leaving the healthy strong wood as long as required. The pruning may be done at various times, but always after the main crop of flowers drop, unless the seed is required. Bourbons may be treated the same as Hybrid Perpetuals.

Insects and Diseases.—The rose in all its stages is, if possible, more liable to the attacks of insects and various diseases than most of any other hardy shrub. There are many ornamental shrubs and trees which grow from year to year without any apparent disease, and increase in beauty as they increase in size. Not so with the Rose, unless it be some hardy climbing variety, for a choice kind of Rose left unpruned and uncared for only one season often becomes so weakly as scarce to be restored to vigor again. Foremost among its enemies is the Rose Aphis (Aphis rosæ), which seems to multiply itself almost magically. Some fine evening in September you may be admiring the vigorous, healthy shoots of your Rose trees, apparently fresh and free from all blight; the next morning by 11 o'clock nearly every shoot may be found coated with its living world of insect life, some green, some brown or brownish, but all absorbed in one pursuit—sucking the life-juice from every shoot and leaf. No enemy to the Rose is so persevering or so injurious, for in twenty-four hours those fine luxuriant shoots crowned with their buds of promise will, if left uncared for, be withered and unsightly. The following is an effective remedy: Take four ounces of quassia chips and boil them ten minutes in a gallon of soft water, strain off the chips, and add four ounces of soft soap, which should be dissolved in it as it cools—stirring it before using; the syringe may be employed especially for climbing Roses, for standard Roses, and Rose bushes. A shallow dish such as milk-dish—half-filled with the liquid, bending the shoot down as near as possible to the liquid, then with a soft painters' brush every leaf can be wetted in two or three minutes with but little waste. A man and boy will get over a large quantity in a day. After ten minutes or so have elapsed, the dead and dying insects should be washed off the tree with pure water from a syringe. The much-abused sparrow will attack the aphis and clean the Rose bushes in a few days, especially in the spring and summer months. In the summer months the Curculio beetle or weevil, which hides itself in the ground, generally close to the stems, often commits great ravages by eating out the centre of each bud and the tips of shoots. He can only be caught at night, and from his dark brown coat and size, approaching that of a ladybird, a sharp eye and bright light must be employed.

In the months of September and October the rose caterpillar makes his appearance; he may soon be detected, for he glues a leaf or two together to form his habitation. As soon as such leaves are perceived, and every morning the trees should be examined, these glued leaves should be squeezed between finger and thumb so as to crush him effectually. Nothing but close attention will save your rosebuds from being perforated by him and ruined. No decoctions or infusions are of any use; the only remedy is the crushing one.

The worst disease known here is the White Mildew, which often makes its appearance the latter end of summer. It is most difficult to arrest; it does not kill the roses, but destroys the beauty of the leaves and weakens the tree. Flowers of sulphur sprinkled on the leaves and shoots in the evening when they are moist with the dew and washed off with the syringe the following morning will arrest it sometimes. If the weather be hot and the sulphur be suffered to remain on the leaves all the day following, mischief often occurs and the leaves burn. If the weather be cloudy it may remain on the leaves for twenty-four hours, but in all cases syringe the leaves and shoots abundantly with pure water to wash it off.

There can be no doubt but that the Hybrid Perpetual is at the present day by far the best class, taking everything into consideration. They bear an abundance of flowers during the whole of the summer and autumn; their flowers are large, very double, most fragrant, and produced through the greater part of the year. Their habit is robust and vigorous in a remarkable degree; they are perfectly hardy, and will grow in almost any soil and situation. In brilliancy of colors no other class can approach them.

At the same time some of the Teas, Noisettes, Bourbons, Mosses, and a few others should be in every collection, such as Belle Lyonaise, Cheshunt hybrid, Devoniensis, Gloire de Dijon. Madame Berrard, Mde. Camille, Marechal Neil, Safrano, and Souvenir d'un Ami (as Teas), Aime Vibert, Cloth of Gold, Jaune Desprez, and Solfatere (as Noisettes), Baronne Gonella, Baronne Noirmint, Charles Souchet, Leveson, Gower, Madame De Stella, Mrs. Bosenquet, Queen of the Bourbons, Reine Victoria, and Souvenir d' la Malmaison (as Bourbons), are about the best in their classes, which are all small as compared with the Hybrid Perpetual class.

LIGHT COLOR ROSES.

[By H.B.]

First of all stands out pre-eminently that grand flower Frau Karl Druschki. This is a Rose of such character, and yet so easy to cultivate, that I opine few, if any, Rose gardens will be without it. The only objection to it is the rapidity with which it collapses. A perfectly shaped flower will fall into a mass of broken petals in a few minutes, and yet, singularly enough, the heat of an exhibition tent seems to have little or no effect on a half-developed bloom. But it is a splendid flower, and will long occupy a leading—if not the leading—position among white Roses. Margaret Dickson, which last year stood me in such good service, has not been so successful this year. I have had some lovely flowers, but the cold nights appear to have prevented the buds from developing well. The same remarks apply to Clio, which has not been successful here. Maria Finger, on the contrary, has been lovely. I do not know any Rose of its type of color more fascinating. Sad to say, however, it is scentless. We used to class Marquise de Castellane very high, but this Rose has escaped eviction from my garden solely in remembrance of bygone years; this season it has returned to some of its ancient form, and for the first time for a long while has found a not discreditable position in the exhibition box. Baroness Rothschild has been quite good and clean, Mrs. John Laing rather disappointing, Mrs. R. G. Sharman Crawford at times most beautiful, at others wanting in shape.

I am wearying of Marchioness of Londonderry. With me it seldom opens well, and the ivory white which marks its color savors to my mind much towards the color of the unwashed face of a sickly infant. Mrs. Cocker has been pretty, but rather flat. And these remarks apply almost equally to Helen Keller and Ellen Drew, neither of which has been very satisfactory. I hardly know whether to class Ulster amongst the dark or light varieties; this is a grand flower, especially for exhibition, as it is such an admirable laster, in addition to being of such good form; but as a garden Rose I look upon it as without value. At the most about two or three blooms on a bush are all that I find it gives, and that is like putting a crust of bread before a very hungry man.

Marchioness of Dufferin is also quite an exhibition Rose, although, according to my experience, it seldom comes in good form enough for this purpose. I must say that it is a Rose that does not captivate me. I do not pretend to say that I have given an account of every light Rose that I grow, but I have jotted down such as have struck me most readily. But I must plead for improvement in dark Roses. Amongst the Hybrid Teas there is an almost too great similarity of color. Liberty, indeed, may be excepted, as the color of this Rose is charming, and perhaps it retains its freshness longer than any other Rose, but how often is it large enough for exhibition? I have seen it admirable under glass, and also from bushes in the open, the buds in the latter case being perfect for button-holes.

TUFTED PANSIES.

A wellgrown lot of Tufted Pansies will blossom during summer when the position and soil are suitable, and to take cuttings from plants blossoming freely means spoiling the display for some time at least. Readers who desire to grow these plants largely, and who also wish to propagate annually by cuttings, would find planting a few old stools in any out-of-the-way place in the garden where, of course, they obtain a certain amount of sunshine each day, answer their purpose. These stock plants can be kept cut back from time to time, and as a result they will form veritable tufts of beautiful, sturdy, short-jointed growths. If some light and gritty soil can be worked into the crowns of these old stock plants during the late summer, many of the pieces will quickly emit roots, which may be detached and planted out in a bed specially prepared for them, and, if need be, again planted out in their permanent quarters before the hard weather sets in. Another method of dealing with old stock plants of this description is lifting them when their shoots are of the desired length and dividing them. By these means quite a large stock can be raised very quickly. This method of increasing the stock of new and choice sorts is followed by leading trade growers. When the pieces just referred to have become established they soon form new growths, and in a short time they in turn may be divided. By this method of raising plants there is very little cutting about of the divided portions of the stock plants likely to take place. Here and there an unwieldy piece of coarse growth may have to be cut back, but in almost every instance the shoots will have roots adhering. In warm weather it is well to shade the cutting beds or cold-frames into which these fresh pieces are put, and in the early evening to sprinkle them with water from a fine-rosed can, as green-fly and red-spider are encouraged by dry conditions.

In the case of those who do not wish to spoil their display by robbing the plants of their young growths, it would be better to cut back a plant here and there among the more crowded of those in the beds and borders. With ordinary care the beauty of the display may be scarcely interfered with. Cut back the coarse growths, as well as those which are weak and elongated, to within an inch or two of the crown of the plant, and have ready a quantity of light, gritty soil to work into and around the cut-back specimens. Equal parts of loam, leaf-mould, and coarse sand or road-grit, passed through a sieve with a coarse mesh, is an ideal compost with which to mulch the plants. It is also a good plan to slightly loosen the soil round the cut-back plants. In dry weather copious supplies of clear water should be given. It is astonishing how quickly the plants retain their vigor, and, in consequence, cuttings of a desirable kind and in goodly numbers may be detached, and in some cases with roots freely emitted from their base.

Where only a limited number of plants is required, the reader may get these from the plants in flower. One or two cuttings from each plant will, no doubt, meet the requirements of some growers, and by carefully detaching these with a sharp knife the plants will not be interfered with. Only those shoots of recent growth should be taken, and if they be made into cutings of about 3 in. in length no better material could be chosen. The cutting bed should receive some consideration, and although some put the cuttings into cold frames, it is better to give them quite hardy treatment, making up a bed outside for their reception. At this time the cutting-bed should be arranged in a nicely protected quarter of the garden, with a warm aspect. Make up the soil some few inches above the ordinary garden level, seeing that this is of a light and gritty character. The surface should be made as even and level as possible, and slightly firmed. An hour or two before the cuttings are to be inserted give the cutting bed a good soaking with clear water from a fine-rosed can, and all is then ready for inserting the cutings.

SWEET PEAS.

With growers in specially moist and favored situations Sweet Peas frequently attain a height of 7 ft. to 9 ft., more or less, and as they always present a fine appearance, and also make an effective display in the garden when attaining such a height, with its accompanying broad proportions, a result such as this is always worth striving for. Plants of these extraordinary dimensions are not confined to the gardens of those in favored situations. A writer says: Our collection is grown on the side of a hill with a north-western aspect, and, as a rule, watering occupies the greater share of our time all through the flowering season. During the present season, except for a few brief experiences of warm weather, very little watering has been done. We have now and then in the showery weather treated the plants to a liberal supply of manure, and to this treatment the plants have given a liberal response in the form of blooms of extra excellence. In a normal season, through being on the hill-side, unless copious supplies of water are always given, and these persistently, comparatively little growth is made. The water so quickly runs away that the work of watering is made so much the harder thereby. At the time of writing our plants vary between 7 ft. and 9 ft. in height, and they are very handsome indeed. Never has there been so prolific a display and the quality of the blooms so fine. The stronger growing kinds in our collection are: Lovely, Hon. Mrs. Kenyon, Mars, Duke of Westminster, Black Knight, Prince of Wales, Miss Willmot, Prima Donna, and Salopin.

THE "CARNATION SHOW."

For such it was to the average man. In full, it was the S.A. Carnation and Picotee Society's Show, held in conjunction with that of the Mount Lofty Gardeners' Society. The latter's chef d'oeuvre being of course the noble display of Rhododendrons.

The Carnation Society are to be congratulated upon the novel arrangement of their tables, the object being first to give plenty of room to the public to readily see and note down the favorite or the striking blooms, and secondly to present an artistic effect to the display.

Last year's Carnation Show, held in the S.A. Gardeners Society's room in Waymouth-street, was so severely handicapped by the woful lack of room for the visiting public that the committee took the lesson well to heart this time.

The credit of taking the Town Hall for the Show must decidedly be awarded to the President, Dr. Harrold. But for his continued and ardent optimism there is no doubt the Show would have been held in a smaller hall in another part of the city. To another member (Mr. Fred. Smith) is due the suggestion for starting a carnation plebescite in the "S.A. Register" the week before the Show, the latter proving a first-class advertisement for the Society.

The Society must be congratulated upon the effective manner in which the exhibits were staged. The old-fashioned boxes with their stiff white collars and flat, inartistic appearance have been changed for sloping stands 2 feet 6 inches long and 4 or 5 inches wide, standing about 4 inches high at the lower end and a foot high at the upper. These are made as light and open as possible. The six holes, bored at about 4 inches apart, carry six funnel shaped cups about 1½ inches across at the top and 4 inches deep, the whole concern being painted black.

A space of a few inches was allowed between each stand to give room to the public to leisurely and carefully inspect the cuts. Each carnation was staged in its cup with a piece of carnation foliage, or "grass," as the knowing ones call it. The tendency to-day seems to be to display everything with its own natural foliage. We give these particulars because they will be of interest to the rapidly growing number of carnation fanciers all over the country, and may serve to give them some ideas that may be useful in their own local shows.

We noticed carnation growers from Broken Hill, Port Pirie, Burra, Gawler, Angaston, and several other country towns, all busy with their notebooks, and more than one of them measuring the stands with a small pocket-tape.

We believe that the time is coming when the Chrysanthemum shows will have to admit the carnation as an equal and possibly as the predominant partner, and that it will give new life to the practice of holding autumn shows.

A further admirable feature of the display was the careful naming of every flower staged, probably over 2,000 separate distinct cuts, not, of course, including the vase classes and those not for competition. Neat white cards about 3 inches long and 1 inch wide with two small holes punched in the centre carried the name of each exhibit, and each card was hung by a small, thin, black hairpin from the edge of the cup carrying the cut.

The large number of visitors who used pencils and notebooks conclusively showed the good sense of naming the exhibits.

We commend the Society for making the Show an honorary one. Far too many growers produce and exhibit blooms purely for the money that is in it, and far too often rely upon their friends to help them to make up their stands. We are glad to believe that the reprehensible practice of flower-mongering is not pursued by the members of the S.A. Carnation Society. No man who has a true sense of honor or a sportsmanlike feeling will try to beat his opponents with borrowed flowers. When he does he is like the jackdaw wearing the peacock's feathers, and he deserves to be as mercilessly shown up. The practice is a despicable and detestable one, and we trust the Society will always be able to be proud of possessing members who will not descend to such meanness.

We would suggest to the energetic and go-ahead committee of the Society that next year they get the prize-winning tickets put on the exhibits at the time of judging, as is done at many of the country shows. Two stewards should accompany the judges, one with a supply of 1st and 2nd prize tickets in his pockets and a good legible black pencil, the other calling the winning name and the class from his book. The judging and ticketing would then be done together, and a lot of trouble and worry taken off the hard-worked, breakfastless, and dinnerless secretary's hands.

Before going to the prize-list we must refer to the splendid exhibit of the Sydney growers, Messrs. Goodwin, Gazzard, and Morris, Messrs. Heyne and Potter acting as agents for them. Some 60 or 70 perfect show blooms of every class known were exhibited. The exquisite perfection and variety of shades and the wonderful condition of the flowers proved an eye-opener to our plains growers, and the general opinion was expressed about as follows:—"Where those flowers were grown thrip does not exist or is no trouble, and scorching heat and drying winds, and troublesome ants are absent;" and it in many cases, to our knowledge, simply confirmed growers of the perpetual type in the opinion that the spring flowering or annual blooming type is one that it will pay well to let alone, at least on the Adelaide plains. These Sydney flowers were apparently dressed, and every flower had a white cardboard collar around its neck just large enough to show the outline of the petals, and just tight enough to prevent a burst calyx from showing. We trust that the Adelaide Society will not adopt this artificial style of staging.

In the spring flowering sect on Mr. H. H. Ising won with "The Gift;" Mr. J. F. Sudholz being second with "Triumph." In the decoratives Mr. J. Beggs came first with "Stella;" and Mr. A. H. Glastonbury second with "Mrs. J. W. Potter." In tree shows, Mr. A. H. Glastonbury with "Ravenswood" was first; and Mr. F. H. Prince with "Thos. Hill" was second.

Mr. J. McInnes was first for champion picotees. If better picotees cannot be staged than those shown we should advise the abolishment of the class. Mrs. W. Thomas was second. The two best South Australian raised seedlings were exhibited by Dr. Harold. One, "Glendeloch," being a magnificent smooth-edged deep yellow with bright red splashes—a most effective flower; the other being of the Princess Alice type, white ground with cerise splashes. Both were raised by Mr. McGann, who states he has disposed of his interest in "Glendeloch" to Messrs. Smith and Menzel, of Aldgate. The former took the championship for a tree show variety; the latter for a tree decorative one.

To a Sydney grower, and possibly to a Melbourne one, the feature probably most surprising would be the number of specimens of the American type in the tree decorative lists. South Australia has the kudos of first discovering and recognising the invaluable qualities of this type, one grower, Mr. J. Beggs, having imported a number of the best sorts from the States. The other distributors of these flowers, Messrs. Smith & Menzel, of Aldgate, raised a batch of 200 seedlings from the choicest hand fertilised American seed five years ago, and sent out over a dozen varieties, of which, "Pasadena," one of them, won first prize with nine votes to spare in the plebiscite taken by the "S.A. Register" recently.

In regard to the judging we must say that in more than one class the decisions turned out to be the opposite of the popular verdict, notably so in the class for twelve carnations, dissimilar, where the first prize was awarded to twelve of which at least six were defective blooms, against twelve in which not more than two could be called defective. Judging, however, is a distinctly thankless task, and where 17 entries occur in one class it is no joke to make a decision.

The carnations were not the only features, for in addition to the cut flowers staged and the six decorated tables, the baskets, bouquets, and buttonholes, the Show was greatly enhanced by the magnificent displays of rhododendrons from Professor E. C. Stirling's and Mr. John Bagot's gardens in the hills; also by the fine displays of Ghent Azaleas, Roses, Delphiniums, Pansies, Petunias, Gladioli, Maples, and general collections of cut flowers. Among the latter the most notable perhaps were one set of three exhibited by Professor Stirling, viz., Kalmia latifolia, Protea Cineraeoides, and Genista Andraeana.

The Society is to be congratulated in every way for the very distinct success of the Show, and we trust that each year will increase its popularity.

EXHIBITING HARDY FLOWERS.

This is a matter which has never yet received the consideration it deserves. It is quite distressing sometimes to see bunches of our best hardy flowers jumbled up together, with little or no effect, and often with about twice as many sprays of blossoms in the bunch as are really needed to display the subject properly. The idea in the minds of those making the exhibit appears to be that of creating a dense mass rather than to show off the charms of each individual subject. While this is so the cultivation of hardy plants will never be taken up so readily by would-be growers as would be the case if the flowers of each kind were more pleasingly and naturally set up. There appears to be an idea that the stems of many flowers, no matter what their height and characteristics may be, should be cut at about the same length, and in consequence visitors are completely at a loss to know what are the points of merit of the respective subjects. We sometimes find, also bunched together in a glorious mass of color, subjects which the well-informed know full well are somewhat unattractive or meagre in their display in the hardy border, and which by their representation at the shows are distinctly misleading. There are so many excellent hardy flowers now in commerce that the indifferent things can easily be spared. The fault in exhibiting hardy flowers at shows generally lies in staging rather small bunches, tightly packed together, with stems altogether out of proportion to the subject exhibited.

Sir Henry Campbell-Bannerman, M.P., greatly admires the effect of heather banks in gardens, especially when as many sorts of Erica as possible are shown upon them.

Madame Emma Eames is a great lover of pansies.

THE JAPANESE GARDENS AT THE WORLD'S FAIR.

[From the "Florists' Exchange."]

The Japanese gardens at the World's Fair are much talked about, and well deserve it.

Contrary to the formal gardens which Americans admire so much, the Japanese is obstinately against them; he goes so far as to call the American's idea bad taste. The Japanese does not like regularity; even in his different structures he deviates from straight lines.

When locating their ground, one of the first requirements of the Japanese is a southern exposure, as the summer breeze generally prevails from that direction.

The Japanese gardens are divided into two classes, viz., the hill garden (tsukiyama-niwa) and the flat garden (hiraniwa). The hill garden is generally given the preference, and no hard work is spared in making or moving a hill where wanted. Either on a large or small scale, the hill garden usually consists of the following:—Four or five hills are made all of different sizee and must look quite natural; the two hills nearest the residence must be low, but show long slopes; the next two hills are higher and steeper but not uniform. The meeting of these slopes should form a valley, through which you have a view of the fifth hill, placed at the farther end of the ground; this latter is quite steep and higher than any of the rest, in order to give it the appearance of a distant pike.

Certain trees are found as regularly in a Japanese garden as though their existence there were imposed by law. They consist of the following, in order of importance:—

Shajin-bokn (the principal tree), usually a fine pine. Keyo-bokn (perfection tree), always a tree of very fine appearance. Sekizen-bokn (tree of solitude), accompanied usually by more trees to make a solitary spot. Sekiyo-bokn (sunset tree), usually found in the western part of the ground, and is intended to shade the garden from the setting sun. A red or bronze foliage tree is usually preferred for this—maple, beech, or plum. Mecosi-natsu (perspective tree), partly concealed and planted a distance away to give a fine perspective. Nagasaki-natsu (weeping tree), usually planted in the foreground, overhanging a stream.

The above-mentioned trees are never omitted in a Japanese garden. Besides them we find a rich collection of other plants, such as Camellia japonica, Aucuba japonica, Azalea formosa, A. mollis and A. amœna, Pyrus japonica, Wistaria sinensis, Iris Kæmpferi. Among grasses we find Arundo donax, Eulalia japonica, Bambusa nigri, B. aurea and B. Fortunei. The evergreen collection is admirable, consisting mostly of dwarfed spscimens; some varieties are trailing, such as Juniperus chinensis procumbens, which is wonderfully well adapted for covering rock-work. There are also the Japanese red pine (Pinus densiflora), some piceas, and a list too long to mention, mostly cultivated in pots of wonderful small dimensions. I must not forget to mention the Japanese maples, which we all know by repatation on account of their brilliant colors, and also some Japanese fern balls (Davallia) of all shapes imaginable.

They have also a chrysanthemum garden. How rich the collection is we do not yet know, but I think they are a wonder if they can beat us on them.

Stones are indispensable in a Japanese garden. There are many of them, but the following ones cannot be omitted:—The Worshipping Stone, usually placed at the centre of an island, and accessible by stepping stones. Dedication Stone is placed in the middle of the ground. Moonshadow Stone is placed away off on the showing slope of the steepest hill. The Seat of Honor Stone is usually found under the tree of the evening sun. The Guardian Stone is generally placed in a most prominent position. There are numerous named stones, in size and number, according to the importance of the estate; they are placed in harmony with other stones and always imitate nature as nearly as possible.

To complete this garden we find a stone lantern, whose light reflects on the water. This stone lantern, together with stone basins, are found in every Japanese garden. The garden includes a small, but very attractive log bridge, a plank bridge of peculiar shape, some stepping stones across the stream, some very fine rockeries, and statuary representing birds.

The buildings on these grounds are also very handsome, and it can be said that the Japanese gardens rank among the best at the St. Louis Fair. It is to be hoped that the city will take pride in keeping them up.

Japanese gardens existed centuries before European gardening. This is due to the comparative freedom that country has always enjoyed, whereas in Europe the lords of feudal times were always fighting among themselves, and had to use their grounds for entrenchments and fortifications, while the Japanese were enjoying the beauties of nature. Therefore, it is justly due to Japan that she should be called "The Flowery Kingdom."

PLANTS FOR PERGOLA.

The following plants would be suitable for spring: Clematis montana, Wistaria, Jasminum nudiflorum, Rose Gloire de Dijon, R. Cheshunt Hybrid, as among the earliest of all to bloom; while for summer the material is abundant. What with Roses in plenty—Carmine Pillar, Crimson Rambler, Alister Stella Grey, W. A. Richardson, Mme. Berard, Climbing Perle des Jardins, and Leuchstern, all of which are very charming and free for the purpose, and may be augmented by such Clematis as Jackmani, J. superba, J. Mrs. George Jackman, &c. For the later lot we would name Clematis Viticella rubra and alba, C. lanuginosa nivea, C. Lord Wolseley, C. Fairy Queen, C. Beauty of Worcester, C. rubella, C. purpurea elegans, C. Anderson Henry, C. Gipsy Queen, &c. To these could be added, such as Tropæolum speciosum, Passiflora Constance Elliot, Solanum jasminoides, Vitis Coignetiæ, Lonicera aureo reticulata, Rubus laciniatus, Jasminum officinale, Lathyrus, latifolius albus, and Polygonum Baldschuanicum.

LIFTING BULBS.

If deciding to lift, it is time this was done, as some at least will very quickly be rooting afresh. Those that are best lifted each year are certain Polyanthus Narcissus, Tulips, and Anemones. This, however, entirely depends upon what they are and the class of soil in which they are growing. Some Anemones are best left alone, other kinds are better in certain soils if lifted each year. Chionodoxa, Scillas, Winter Aconites, Crocus, Snowdrops, if the common kinds, may go on in the same soil for years, while Narcissus, Tulips, and Iris require in a measure, periodical lifting. All bulbs succeed quite well in the usual sandy loams, though some kinds are found to do quite well in the more clayey soils. Some Narcissus—e.g., poeticus kinds, incomparabilis in variety generally, maximus, princeps, and Emperor—are quite a success when grown in strong or heavy loam, and in particular where such soils are well drained, a most important item generally.

IRISES.

Few appreciate to the fullest extent the German Irises. We forget how long these brighten our borders with the loveliness of their gold and purple blossom. Charming for early blooming are the Persian Irises, mingling their petals of white, blue, and purple amid their bright green foliage. When we think of summer and its flowers it is then that Irises appeal to us, some with blossoms quaintly marked and blotches, some preferring the shelter and the sunshine of a warm border, and rivalling the Orchids in beauty. It is not, however, merely as border flowers that they are interesting. Happy is he who can grow the water or Flag Irises. These are the flowers that blossom with Water Lily and Forget-Me-Not—

> "Dwelling by still rivers,
> Or solitary mere,
> Or where the sluggish meadow brook delivers
> Its waters to the weir."

There is a charm about the Iris, grown on borders or adjacent to lawns, partly in the shade, so that their blossoms are gradually developed. They continue beautiful with a background of foliage, which serves to heighten the wealth of their gorgeous tints.

Let us consider what varieties are best for providing us with hosts of flowers for vases and epergnes, as well as giving us blossoms over the longest period. There are the Netted Irises which are fragrant and bloom early. Similar in color and sweet scented also are the flowers of I. Bakeriana which follow. I. germanica is the commonest of the genus, the Flag Irises, growing where one would least expect to find them, amid the dust and impure atmosphere, often flourishing most where other plants fail, and giving us blooms diversified in color. Where the soil, too, is dry the Iberian Iris (I. ibirica) will serve well; the flowers are large, flecked, and spotted, with standards white, falls veined with blue and purple over a yellow background, blossoms singularly beautiful and elegant when cut with some of their flaglike foliage. One of the choicest of the Flag Irises is Monnieri, well fitted for a border where the soil is moist and rich, a late blooming, sweet-scented sort with yellow flowers margined with white. I. Pseudo-acorus has already been alluded to, it is the commonest of all, the yellow water Flag, and will grow in any moist and damp situation. I. pallida loves a moist, deep root-run, but does well even when planted on a dry soil; the blooms, however, are not so fine nor do they last so long as when planted under cooler conditions. A spring blooming dwarf Iris is to be found in pumila, seldom attaining more than a height of 7 in. or 8 in., flowers blue and purple. English Irises again belong to a distinct class, blooming a little later than the German, tall and stately, possessing many self-colors, having rush-like foliage. I. orchioides is extremely beautiful, differing entirely from any other, and preferring a warm, sheltered situation. I. asiatica closely resembles the German, but the blossoms are finer. But it is doubtful whether any of those mentioned have ever been so popular as the Spanish Irises. To say that they are extremely light and graceful, and, therefore, particularly adapted to table decoration, will grow in any open situation in a free, well-drained soil, flower freely, are possessed of delicate color, and that bulbs are cheap, is only giving expression to facts that are now well known. Not many, however, when planting the bulbs remember to pot up a few for early spring blooming in the house. Not the Spanish alone lend themselves to forcing, but many of the other sorts if lifted from the open and brought under glass in spring, will bloom freely. Irises to be effective should be grouped together, and in planting one should remember those that bloom late as well as at midsummer, kinds like alata, whose lilac blossoms flecked with yellow remain on warm and sheltered borders many weeks, often until the later days of December.

HYBRIDIZING CANNAS.

[From the "Florists' Exchange."]

Success in hybridizing the canna requires a love for the work that will inspire the most painstaking and patient effort. But having learned the habits of the plant and the laws of nature as applied to plant breeding, the originating of new kinds is very fascinating.

It was nearly a dozen years ago when I first became interested in this subject, for it seemed to me that the canna was susceptible of vast improvements. The late M. Crozy, of France, was undoubtedly the pioneer in the field of improved canna culture. The finest introductions which he gave us were Mme. Crozy and Souvenir d'Antoine Crozy. They alone won for him an international fame, and deservedly so. But all his new kinds combined covered but a comparatively small range of colors, and left still a vast field for the enthusiast.

As in other lines, so in hybridising; he who aims to accomplish certain results and works intelligently toward them is, as a rule, the most successful. My first aim, therefore, was directed toward producing cannas of larger, finer flowers, with a constitution better suited to our peculiar climate than were the French kinds, and particularly did there seem to be a field for the solid colors in the reds, yellows, and pinks. Philadelphia was one of the earliest results of this work (1896), and Duke of Marlboro followed soon after with a shade about two points darker. Both these varieties still hold their places as two of the best of the red flowering sorts.

Next came Buttercup, the yellow standby. In addition to its excellent qualities as a good grower, adaptability to all localities, and its pure, solid color, it is also the earliest to open its flowers and blooms latest in the autumn.

At one time my principal aim was to produce a better strain of pink cannas, and with Pink Ehemanii to work on, the hoped-for improvements were finally realised in such kinds as Rosemawr, Luray, West Grove, and Betsy Ross.

The next marked development was among the orchid-flowering varieties. Mr. Damann, of Italy, has given us some of the finest we have in this class, but, with the exception of King Humbert, nearly all have been of the variegated shadee; therefore it was most gratifying, after an extended effort in this direction, to be rewarded with the now well-known red orchid-flowering canna Pennsylvania. Within the present year a still greater improvement is found in the new large orchid-flowering canna Louisiana, which we expect to put on the market next spring. The color of Louisiana is intense rich red, the derkest of its class; it is the earliest to bloom, and produces flowers 7 to 7½ inches across. We have a large bed of it now in bloom at the St. Louis World's Fair.

At present the interest is centred on the bronze-leaved varieties. The finest of this class is Black Beauty, which has the darkest foliage of all, but very small flowers. The aim has been to produce large, fine flowers on the same dark foliage, and Brandywine is the best result. It is my favorite as a bedder because of its rich foliage, made more so by its beautiful, large, dark red flowers. Other excellent new lines in this class are Hiawatha, Chautauqua and Mount Etna. All of these are particularly fine for making grand displays in beds, and when arranged with other colors may be made to produce most striking and effective contrasts.

But perhaps the most noteworthy achievement of all has been the obtaining of a white canna with a good large flower. This was most difficult of all, because there was so little to work with. But after ten years of crossing and recrossing one well worthy of a high place in the canna world was finally obtained in the new white canna, Mont Blanc.

The great wonder to me is that so many gardeners have as yet failed to appreciate the wonderful possibilities of the canna as a bedding plant, for frequently in parks and private lawns do we still see the old, ungainly foliaged cannas, with very small flowers.

I look for the time when the canna will also take its place in the conservatory and for indoor decorative use, for the brighter of the dwarf flowering kinds, such as the new Harlequin, deserve to rank even with the fine orchids of the wealthy.

The field for new varieties is still very large, for there are many combinations of color in flower and leaf that may be hoped for. When we consider that with all the work of the hybridizers in roses in recent years they have been unable to improve on the color and form of a rose that was introduced some forty years ago (General Jacqueminot), we may rightly conclude that the improvements obtained in the canna in the past twelve years have been very marked indeed.

IRRITATION CAUSED BY HUMEA ELEGANS.

By Dr. Hearnden.

A female patient of mine who has a particularly delicate complexion, has during the last few months been frequently suffering from vesicular eruptions on the nose and cheeks looking like impetigo. They quickly subsided under treatment, but as there was an almost immediate relapse she consulted a specialist, who diagnosed eczema, and naturally ordered a course of arsenic. In June I found her with a red, swollen face, the left eye closed, large vesicles containing clear serum on the cheeks, and a patch of eczema on the left side of the chin. She was greatly alarmed, as she supposed that she had erysipelas. Her temperature, however, was normal. She was unable to account for the attack, but first noticed it after playing ping-pong. She had not been handling Primula obconica as she was aware of its dangers, but she volunteered the statements that she had been feeding chickens with crushed bones and that she had noticed some irritation about the nose. The attack subsided in the course of a few days under "lotio plumbi subacetatis." The first time she went out, at the end of the week when her face was well, she complained of itching of her right eyelid, and in the course of a few hours her face was as bad as ever. She then said that she had picked a leaf of Humea elegans, and had smelt it, and that she had been in the habit during the last few months of picking a leaf and rubbing it on her veil, as she liked the perfume. The position of the rash was just where a veil would touch the face and the patch on the chin corresponded to the place where the veil is screwed up and tucked in. No doubt this had been the cause of all the trouble.

Humea elegans, a native of New South Wales, is frequently grown in greenhouses for the sake of its perfume and flowers. The leaves are not unlike those of the tobacco plant in shape, but much more shiny, and they exhale a strong smell like incense.

A leaf rubbed on my arm left a gummy secretion with a powerful smell, and was followed by a bright red punctiform rash, which lasted all day, but caused little irritation. A gardener has told me that he has noticed his arms itching after moving the plants, and that the gardener who gave them to him suffered from a severely inflamed face, which was ascribed to an irritating soap, but no doubt was due to the Humea. It is well known that many plants like Primula obconica are irritants, but that Humea elegans is one of them was new to me, and may be a warning to others.—"Lancet."

ROSE CULTURE UNDER GLASS IN AMERICA.

FORCING TEA AND HYBRID TEA ROSES.

The forcing of roses under glass is conducted on a large scale and with much success in the United States, and the following notes on the practice that is adopted by the most successful growers which Mr. Ernest Asmus has contributed to the "Bulletin" of the American Rose Society can hardly fail to be useful and interesting to growers on this side of the Atlantic.

Houses for forcing roses should be built as light and airy as possible and have a southern aspect, the houses running east and west. Some years ago it was thought by most all practical growers that good roses could only be grown in three-quarter span houses, but experience has taught me that equally as good roses can be grown in even span houses—which model of house I have adopted for the future, on account of its simplicity in handling and construction.

Soil, the principal thing in rose growing, should be procured, if possible, in the fall, and that from an old pasture that has never been cultivated I find best suited. Set up your compost heap just before winter sets in, of three parts of good sod soil and one part cow manure, not too high, so that the frost has a good chance to penetrate. I generally make mine 3 to 4 ft. high. Let it remain without any covering, and as soon as the weather is fit in spring, and the soil not too wet, turn the heap over and let it remain, say, a month or six weeks, when it should have another turning; and it will then be ready for use in the forcing house. When wooden benches are used for forcing 5 in. in depth will be sufficient. Fill up your benches and give a sprinkling of fine ground bone or wood ashes, but be careful not to use too much—one bushel to a 100-ft. house is plenty. Then turn the whole soil, mixing the bone and the soil thoroughly with your hand, picking out all stones and rough material. Your bench is now ready for planting, which should be done, if possible, in the months of May to July.

Select good healthy plants and set them in your benches about 15 in. apart either way, care being taken that the soil in which you plant is neither too wet nor too dry, and that the young plants have a thorough watering before being removed from their pots. On no account allow your young plants to flag on a hot summer's day. When the whole house is planted give a good watering, and clean the whole house, under the benches as well as the walks, giving the walks and under the benches a good sprinkling as well, as it tends to keep down the heat, giving a better temperature for rose growing.

If solid beds are used instead of benches, they should be carefully prepared with lots of drainage (I generally use about 15 in. of broken stone in the bottom), and the same process gone through with the soil, as described above, with the exception that the depth should be increased to 6 or 7 in.

Now, the house being planted, our care begins. The young plants must be carefully watched. Do not allow the weeds, which will appear a couple of weeks after planting, to get too large. The plants should have a careful syringing about twice a day, and the soil kept in a good, moist way (but not water soaked), aphis and other insects carefully looked after, and as much air as possible given, from early morning until after sunset, when the ventilators should be about half closed down. Try to keep your rose-house temperature in summer one or two degrees lower than the outside temperature, which can be done by using the hose judiciously under the benches and walks. As the roses begin to grow they need staking. I find No. 8 galvanised wire makes a neat and durable stake. All new growths should be carefully tied, and the buds picked off.

Do not allow your plants to bloom before they have obtained a proper size, which with good treatment will be about two months after planting. Mildew, one of the worst enemies of the rose in summer and fall, should be carefully watched, and at the least appearance the plants should be dusted with flowers of sulphur, which should be kept on the plants two or three days, and the temperature on sunny days be run up to 85 and 90 degrees. Syringing stops until the sulphur is to be removed from the plants. I cannot lay too great a stress upon the importance of ventilating. Keep as even a temperature as possible. Do not allow your houses to run away up in the 80's before you give air, but start early in the morning, and, as your thermometer rises, let your ventilators rise as well, for nothing is more hurtful to a rose than sudden changes, which you are sure to get when you let your ventilators remain closed too long and then open at once to their fullest capacity.

As we come toward fall, say, September to November, the most critical time of rose growing has arrived. The changes in the atmosphere between night and day are oftentimes so great that at this time our checks most occur. The night temperature in a rose house should never be allowed to drop below 60 degrees, and even 65 degrees will do no damage at this time of the year. Although it seems absurd, I invariably start firing on a very moderate scale in September. As the weather grows colder, of course, your fire heat has to be increased, to keep your houses up to the required temperature, which should be from 56 to 58 degrees at night for all tea roses, and from 58 to 62 degrees for hybrid teas, with the exception of Meteor, which requires a night temperature of 65 to 70 degrees, with the corresponding increase of 10 degrees in the day time. During bright summer weather in late fall and winter begin ventilating when your thermometer reaches 66 degrees and increase inch by inch as your thermometer rises.

About the first week in January feeding of the roses can begin. I use liquid manure made partly out of horse, cow, and sheep manure, made about the strength of strong tea, of which I give my roses a liberal drink about every fortnight, using no mulch until the sun gets strong, about April, when I give them in addition a light mulch of spent horse manure from old mushroom beds.

For aphis or green fly the best preventive I have found is tobacco in its various ways. Fumigation is not safe when the plants are in bloom, excepting for a few varieties, and it should only be used before the plants begin to bloom. Tobacco stems spread under the benches, or hung up along the walks, will keep fly down, but the old should be removed and new stems substituted every two or three weeks, for this mode is only a preventive, and the fly once there is hard to remove, unless radical measures are adopted, which generally mean the loss of a crop.

If you expect success in forcing roses do not forget that the rose wants to be watched from its infancy just as much as a child in its infancy. Careful training and watching will make a child grow up as a useful member, and careful watching of the smallest details will make a rose bush under glass tend to give profit and enjoyment to thousands.

For the assistance of all those who are not familiar with forcing roses I give below a list of tea and hybrid tea roses, which can be successfully forced in this latitude. Teas: Bride, Bridesmaid, Mrs. Pierpont Morgan, Madame Cusin, Madame Hoste, Madame de Watteville, Maid of Honour, Ma Capucine, Perle des Jardins, Sunset, Golden Gate, Bon Silene, Safrano, Niphetos, Madame Chatenay, and Papa Gontier. Hybrid teas: American Beauty, American Belle, Madame Caroline Testout, Kaiserin Augusta Victoria, Meteor, Souv. de Wootton, President Carnot, La France, Duchess of Albany, Madame Augusta Guinnoisseau, Admiral Dewey, Mrs. Robert Garrett, and Liberty.

The best fertiliser for carnations is good rotted barnyard manure. Applied as a mulch, mixed with the soil, and given in liquid form—used in any or all of these ways, there is no fertiliser that can beat it.

It is generally understood that the throwing of blind wood from roses is the result of an impoverished soil.

The Orchard.

OPERATIONS FOR DECEMBER.

By W. J. Allen.

Cherries, apricots, and peaches will be plentiful this month, and most of the cherries will find ready sale for dessert purposes; some will be converted into jam. Early peaches are valueless for jam-making, but are excellent for dessert, and are good when stewed. Apricots, though suitable for dessert, and used largely for that purpose, find ready sale at the jam factories, where they are canned, pulped, or made into jam. In our drier and warmer districts the fruit is generally dried, and put upon the market in this shape—1 lb. of the dried product being equal to from 4½ to 7 lbs. of fresh fruit according to the variety dried.

When used for this latter purpose the fruit should be allowed to ripen well before picking, but it must be handled before it is so ripe that it will mash up when handling. The best dried fruit is that made from the ripe fruit. In drying, the operator must see that the fruit is kept clear of dust, as any dust falling on this or any newly-cut fruit will adhere to it and spoil it, therefore, whenever possible, use a lucerne paddock for drying, or, in any case, keep as far away as possible from dust and sand.

As soon as the fruit is quite tough, and has lost most of its moisture, it should be taken from the trays and put in calico bags, and securely tied in order to keep the moths out. When packing them for the market, see that they are graded and packed in neat boxes which have been lined with paper.

In the drier districts where irrigation is practised it will be found necessary to water all trees, vines, lucerne, or any other crops this month, and be sure to work up the ground as soon as it is dry enough to allow the horses and cultivator on the land.

All orchard land should be kept free from weeds, and to accomplish this the horses and cultivators should have but little rest this month, as an orchard neglected for a few days will soon be covered with a coating of summer grass which will take many a hard day's work to eradicate, and couch grass spreads rapidly when left undisturbed. Where there are bad patches of couch grass these should be ploughed up and harrowed on a very hot day, as the roots soon die exposed to the sun.

Passion vines, which have been properly pruned and manured during November, will now be putting on good growth and blooming freely. This fruit will be ready to meet the demand at Easter, when it usually finds a ready sale at good prices.

Keep a strict outlook for pests, and if trees have not been fumigated or sprayed, as the case may be, the grower should lose no time before beginning to fight them.

For scales on citrus trees, December, January, and February are good months for either spraying or fumigating; but for fungus diseases it is generally best to spray once before the trees bloom, again as soon as the fruit has set, rather than leaving it until now. In many cases, however, later sprayings are both beneficial and necessary.

The grower should not neglect to either fumigate or spray all citrus trees so as to ensure clean fruit and healthy trees.

Keep a strict watch over all bandages placed on apple, pear, and quince trees. They should be overhauled, and all larvæ destroyed at least once every ten days; also pick up and destroy all fallen fruit.

If fruit fly should make its appearance, all infested fruit should be destroyed so as to assist as far as possible in keeping this pest in check.

LIME AS A SOIL IMPROVER.

The failure of a soil to give remunerative returns may be due to various causes, such as absence of soluble plant food, improper cultivation, or the unfavorable mechanical texture. The latter condition is a very important one, for, although the soil may be rich in plant constituents, it is nevertheless imperative that, in order to secure the best results, it must be brought into a state most favorable for the crop to be grown. This means that the mechanical condition must be such as to allow the plant roots to ramify unhindered through every inch of soil in their search after food.

There are many soils, especially those of sticky, clayey nature, which it is not always an easy matter to get into such a condition. In a dry time they get hard, something after the consistency of a brick, and are very liable to crack. In wet weather they get boggy, and often remain in this condition for some considerable time. When in this state, to cultivate or even keep down the weeds is no easy matter, consequently they stand at a great disadvantage compared with soils of a more friable nature. Another feature of many soils is that they are of a cold, sour nature, and, unless thoroughly cultivated and exposed to the sweetening influence of the atmosphere for some considerable time, poor results are sure to result.

In the older countries, when dealing with refractory soils, farmers often find it advantageous to bring to their assistance what may be termed special soil improvers. Of these there are two that stand out pre-eminent, viz., farmyard manure and lime. Both have their special uses and advantages, but it is to the part the latter plays in relation to soil fertility that I would specially draw attention.

The practice of using lime in connection with agriculture is a very old one, and I believe that the benefits derived from liming are yet but dimly recognised and the practice seldom adopted. The scientific name for lime is calcium. The usual way to obtain lime is to burn limestone (which is carbonate of lime) for about two days in wide-mouthed kilns. The heat expels water and carbonic acid from the limestone, converting it into calcium oxide, or, as it is more commonly termed, quicklime. This expulsion is worth remembering, as on the first opportunity lime takes in the water and carbonic acid driven out during the burning process, and gives out the heat received in the kiln. The effect this has on the soil will be seen later on. Other carbonates of lime are found besides limestone, such as chalk (called whiting when ground), coral, marble, oyster-shells, and shell sand. Lime derived from the latter generally contains too much sand to be of any great value for agricultural purposes, unless procured at a very cheap rate.

Such lime is a hard, heavy substance, greedy of both water and carbonic acid. It absorbs large quantities of water without becoming wet, and crackles and hisses and behaves in a life-like manner; hence the name of quicklime.

Slaked lime is a powerful alkaline substance used in many ways. Mixed with sand and water, it forms the mortar used for building purposes.

In agriculture lime is generally put on the land at the rate of one to five tons per acre. Finely pounded lime unslaked is sometimes applied, and in this form produces more powerful effects. Lime ought to be harrowed into the soil immediately it is applied, so as to cover it up from the air, from which it would absorb carbonic acid gas and speedily be converted into carbonate of lime. When covered up by the soil it takes the carbonic acid from the decaying vegetable matter or humus, hastening the process of decay, and thus liberating hydrogen and nitrogen. This is rather important, as when the liberation of both is simultaneous and slowly effected they unite in proportion of 3 of hydrogen to 1 of nitrogen, forming ammonia—a very valuable plant fertiliser. Unfortunately, there are conditions under which this formation is not always certain to result, such as lack of moisture, so that lime may sometimes destroy the vegetable matter in the soil to no good purpose.

Some generations ago farmers in the old country discovered that great crops of grain could be grown by the aid of lime, and they used it unsparingly, even although they had in many instances to convey it from great distances. For a time they succeeded in producing heavy crops, because the soil was full of manure and humus, but by and by they found that lime had ceased to work miracles, and, though some people tried to make it do what it once had done by doubling the quantity applied, it came to be admitted that lime had not the beneficial effect it once had. Later on it was found out that, beyond supplying the small quantity of lime necessary for the growth of plants in soils where it naturally was deficient, the lime had been decomposing all the vegetable matter—the only store of nitrogen in the soil—so that it had now nothing in it but mineral food, viz., lime, phosphoric acid, and potash, etc. Though the lime did not supply any nitrogen to the soil, yet it produced, for every ton applied, much the same effect as the application of so many hundredweights of nitrate of soda or sulphate of ammonia. The difference in the condition of the soil after a crop grown by the application of lime and one grown by the application of nitrate of soda or sulphate of ammonia was, however, very great. In the one case the soil had to grow a heavy crop at its own expense; on the other the crop was grown by aid of the plant food in the manure supplied. This action is, no doubt, what has given rise to the old saying that "lime enriches the father, but impoverishes the son." The application of large doses of lime to light sandy soil, or to soil that has become exhausted through continuous cropping without backing it up with fertilisers, is a great mistake. It is something like applying a whip to a done-up horse—trying to take out what is really not there. An old couplet says that "Lime and lime without manure will make both farm and farmer poor."

In applying lime to the soil care must be exercised as to the nature of the soil on which the application is to be made. I have known of some cases where as much as 10 tons per acre was applied without any bad result, and others where half that amount practically ruined the soil for certain crops, such as oats and barleys. The only rational cure for land that has been what is termed burned with lime is to supply large quantities of farmyard or nitrogenous manure.

If lime is to be applied to the soil in excess of what is actually required as a plant food care must be taken that it has got something to work upon, either a strong clay or soil over-loaded with humus. It can be safely used to advantage on newly-drained swampy land, and also on newly-cleared forest land of the "black soil flat" type. Its effect on the above-named class of soils is to render them more porous and open, removing in a large degree the adhesive sticky nature when wet, and making them more friable when dry. This condition being brought about, thorough cultivation can then be practised, ultimately resulting in the land being brought from a low to a high state of fertility.

Its correction for sour lands is well known. Being strongly alkaline, it neutralises acidity, thus ridding soils of deleterious matter harmful to plant life.

Lime is also a great assistance to drainage —in fact, I have seen cases where lime in itself proved a means of drainage. This was on a field of stiff clay, on the surface of which water used to lie for some considerable time after heavy rains. Plots in various parts of this field were limed, and on those the effect was most marked, for after rains no water was seen to lie on their surface, but on the unlimed parts the water remained as before. Another highly important function of lime is the favoring of the development of nitrification in the soil. Nitrification is an action of micro-organisms in the soil which act upon nitrogenous matters, converting them into nitric acid—a very valuable plant food. A certain amount of alkalinety is required for their development, and the presence of carbonate of lime in the soil furnishes this necessity.

Lime and phosphate powders containing caustic lime may be safely mixed with all potash manures, nitrate of soda, nitrate of potash, bones in any form (except dissolved bones), mineral phosphatic manures (except superphosphate). Neither caustic, slaked lime, nor phosphatic slags, which contain caustic lime, should be mixad with sulphate of ammonia, guano, or any animal or vegetable matters yielding ammonia, because the lime would take up the sulphuric acid of sulphate of ammonia and the carbonic acid of the decaying animal and vegetable matter, setting free the ammonia which these things contain.

As to slaking and mode of application, the common practice is to spread the lime in small heaps and cover up with soil. Providing there is a like moisture in the soil, the lime will in a few days be sufficiently slaked to allow of its being spread with a shovel. There is, however, a little risk attached to this method, for, should heavy rains ensue before spreading, the lime will be converted into a paste, difficult to distribute, and, moreover, less powerful in its effects. Another and perhaps safer way is to tip in a long heap adjacent to water and slake, then distribute by means of a dray, one hand leading the horse at a slow pace, another standing on the dray spreading with shovel. By working in this fashion—against the breeze—very little discomfort is felt. To keep the fine dust from lodging on the horse's skin, a cover of some sort should be put on—say a couple of bags under the harness.

Numbers of experiments are being carried out at the Biggenden State Farm, with a view to testing its effects on the soil, which varies from dark basaltic to sticky cement. Its beneficial effect on a row of rosellas is easily to be seen. In a row of twenty plants only half were limed, the application being at a rate of two tons per acre. In the no-lime lot, four out of the ten have died, and other two look sick. Amongst those limed, only one shows signs of dying, all the others looking remarkably healthy. At the time of writing only the first picking of fruit has been taken; the returns being respectively—unlimed, 8 lb.; limed, 22 lb.

The land on which the rosellas are being grown is of a very stiff nature. On removing the loose cultivated soil from around the dead bushes, cracks were found, which, no doubt, severed the roots, thus causing death to the plant. The action of lime on this soil has undoubtedly been to keep it more loose and friable, preventing cracking, and thus better able to conserve the moisture.—"Queensland Agricultural Journal."

Destroying Slugs.—Freenig a garden from slugs and snails when they have been long left to breed abundantly is always a difficult matter, and it is more so when the garden is surrounded by hedges or similar harbor. Dressings of soot or fresh slacked lime are very efficacious in killing the pests if applied at the right time, and that is of an evening, when damp falls and the pests come out to feed. Then dustings of these powders are very destructive. Again, when cabbage, cauliflower, lettuce, or similar plants are put out, and it is found that slugs eat them, if looked for at night with a candle hundreds may be caught and destroyed; that, too, is the time to use the soot and lime. If the pests harbor at the foot of walls or fences, strew salt freely and often there.

Once upon a time Sparaxises were quite popular, and there are signs of a returning favor.

CULTIVATION.

By Jas. Lang.

A great variety of work requires attending to during this month, and ploughing, harrowing, and scarifying will occupy a good deal of time in order to get the land into good condition and free from weeds. This work should not be delayed, as the ground soon sets hard, and makes it almost impossible to do a good job. This is all the more necessary where young orchards have been planted, as keeping the ground constantly stirred and free from weeds contributes more than any other operation to the successful growth of the young trees. Look carefully over the young trees and remove all unnecessary shoots, leaving only those required to form the tree.

Spraying.

Spraying for the black spot on the apple and pear with Bordeaux mixture requires early attention, the strength 6—4—40 is recommended.

In the moist districts to the east of Melbourne extra vigilance will have to be given to the matter, the past summer being unusually moist developed the disease to an abnormal extent. The first spraying should be given when the bloom buds are just bursting and another when the young fruit has grown about the size of small walnuts; should the season prove moist further spraying will be required at intervals of about a fortnight or three weeks.* Instructions as to the best method of mixing the Bordeaux have been given in previous numbers of this "Journal." Some orchardists who have a difficulty in procuring fresh lime will be glad to know that lime in air-tight tins will keep fresh for several months. The plan adopted by the writer last year was to fill kerosine tins with the fresh lumps of lime and closed down by pasting brown paper over the aperture, and when a tin was opened later on the lime was as fresh as when put in the tin. Apricots also will require spraying with Bordeaux for shothole and scab; a good time to spray is when the trees have just gone off the bloom, and another spraying about three weeks later.

Spraying for the codlin moth will also have to be attended to, the first spraying should be given when the petals have dropped from the blossoms, and before the calyx closes up. Another spraying should be given in about four weeks time, and afterwards at fortnightly intervals right through the summer. The moth generally makes its appearance about the early part of October, and it takes about three months before the first brood are all hatched out. Trees should also be bandaged, and looked over at intervals of ten or fourteen days throughout the summer; this helps to keep down the numbers of the second brood very considerably.

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*In Bulletin 17 just issued the Vegetable Pathologist recommends only two sprayings at the most, the first as the buds are bursting and the second just as the fruit has set.—Ed. "Journal."

Vegetable Garden.

OPERATIONS FOR DECEMBER.

By W. S. Campbell.

Young growing crops should be hoed and kept free from weeds. If this is not attended to they will soon be smothered, and time, seed, and labor wasted.

French beans, peas, and seed of such vegetables as melons, squashes, &c., may be sown.

Advantage should be taken of showery weather to plant out from previous sowings of cabbage, celery, &c. Carefully examine young cabbage plants for signs of club root, black leg, and other fungus diseases. Any so affected should be burned at once.

Lateral shoots should be pinched from tomato plants, and each plant securely staked. Should any insect or fungus then attack the plants they can easily be sprayed. Early tomatoes are almost invariably attacked by the larvæ of the tomato moth (Heliothis). The plants should be sprayed on the first appearance of the grub with Paris green, using one ounce of Paris green to 10 gallons of water. One pound of new lump lime must be slaked, and a quantity of water (about two gallons) poured over it. It should be thoroughly mixed, and strained into the spray pump or other vessel making up to 10 gallons. The Paris green should be mixed in a saucer or such vessel, in a small quantity of lime water, and when thoroughly mixed, added to the 10 gallons of lime water. This should be thoroughly agitated while being applied. Do not use if the fruit is ripening.

MUSICAL EDUCATION.

There are many country homes, and also homes in the suburbs, where gardeners and their families greet an evening's recreation with music as a great boon. So it should be. The difficulty very often lies in the fact that while the piano or organ is there the musician is wanted. To supply this pleasure we are introducing from America a Chart of Musical Chords, arranged by Mr. Charles E. Pratt. By the use of these Chords, which any ordinary intelligent person can learn quickly without any previous knowledge of music, an accompaniment can be played to any song yet composed. In addition to the Chart the publishers supply a book of popular songs, containing 48 pages, all for the very modest price of 2s. 6d. and postage. On receipt of 2s. 6d. and postage 2d. we will send the chart and music to any address in the Commonwealth. An advertisement appears on page 16.

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Answers to Correspondents

J Speirs.—Oleanders will grow from 5 to 20 ft. high almost anywhere, require very little attention, and are as hardy as you could wish. Four varieties can be obtained—red, white, striped, and pink. They can be grown from slips, but your best plan would be to write to Henry Sewell, Adelaide, for rooted plants, which would be forwarded in small pots, together with any other hardy plants you might require. A good hedge plant and wind break is Pittosporum. The African Box Thorn is also good, but requires a lot of cutting to keep within bounds. Diosma is one of the hardiest and sweetest of shrubs, According to soil and position will grow from 1 to 5 ft. Hardy shrubs are—Abutilon, Acacia, Bouvardia, Buddlea, Brugmansia, Cantua, Clianthus, Eriostemon, Erythrina, Escallonia, Euonymus, Fabiana, Grevillea, Hibiscus, Hymenosperum, Jasminum, Lantano, Leucadendron, Myrtle, Oleander, Philadelphus, Pittosporum, Plumbago, Poinsettia, Polygala. Prunus, Punica [pomegranate], Salvia, Spiraea, Statice, Swainsonia, Tamarix, Tecoma, Templetonia, Veronica, Wigandia. We would recommend you to write to the nurserymen for plants of the above. You will find them very reasonable in prices, and they will give you directions about planting. Get your ground well turned up and manured. The soil continually ssirred and free from weeds, and you will be ready for planting after summer.

The Flower Garden

OPERATIONS FOR JANUARY.

By Thos. W. Pockett.

Tying, staking, watering, and manuring should be the chief work for the next two months, beyond the general hoeing and stirring of the soil after watering, or to admit water.

Cannas should be looked over, removing old leaves and flowers, and with a little assistance in the shape of manure and water a glorious display will be assured during autumn. Dahlias that remained in the ground last winter, and reflowered during the early summer, may be cut down to the ground early in the month, so as to get fresh growth, which will flower during March, April, and May.

Chrysanthemums that have been allowed to grow from stools may also be cut down, unless large blooms are required, and in such cases young plants put out in September or October would be best, and any shortening should have been done not later than the middle of December.

Chrysanthemums require special attention just now. If tall plants are preferred, they should be staked neatly, the stems thinned out, the ground around them mulched, and a thorough watering given once a fortnight; but if dwarf plants are wanted the stems should be thinned out now, leaving only the strongest. These should then be cut off 2 in. above the ground, and should be well mulched; if well established, water must be given sparingly. Keep the surfaces of all beds frequently stirred to a depth of about an inch. Cut back tea varieties of roses and mulch and thoroughly water them to secure late flowers. Choice climbers, as Tacsonias, Bougainvilleas, and Passifloras may be planted from pots if well rooted, as warm weather with plenty of water is suitable for them. The spot where they are to be planted should be well prepared to a depth of 18 in., but after they have once started any soil appears to suit them. Sow seeds of Primula sinensis and of Cineraria at once.

Any bare places in the borders, caused by flowers or plants that have finished blooming, may be filled up for the autumn.

For a number of years past I have sown Cosmos, Marigold (French and African), Zinnias, and Variegated Maize, at the beginning of January. They generally come up with little trouble, and by the time the commence to flower the weather is cool, and a fine display is produced with practically no trouble, and there is the advantage of the flowers lasting longer, whether cut or on the plants.

Roses.—The autumn display of Roses is generally the best. more especially with the Teas and Hybrid Teas. All old flowers should be cut away, and any bushes making unnecessary growth should be thinned out, and if the rainfall is deficient about March give a good watering, or, what is preferable, liquid manure.

Lawns.—Buffalo grass lawns may still be made until March or April. When it is intended to grow other grasses with the Buffalo, nothing is so good as Kentucky blue grass. I generally have a patch ready, and dibble a piece in about every foot when planting the Buffalo. The one leads during the summer, while the other is green and fills up all the available space during autumn, winter, and spring, yet the one does not harm the other or become patchy.

Consideration should be given to such plants as those which produce flowers during the autumn, which season is often the most satisfactory during the year in many parts of the State. The most conspicuous flowers are the Chrysanthemums and the Dahlias. If superior blooms of either of these plants are required, a good deal of trouble is necessary for some time before they flower. Both need good supplies of water, if the rainfall has not been sufficient, and both are improved by the application of liquid manure, which, however, should be discontinued as soon as the flowers are partly open. The necessary liquid manure, which will be found useful also for any other of the garden plants—including pot plants—can be made by soaking cow, horse, or fowl dung, either separate or combined, in water. Say a bucketful in half a hogshead of water. Only the clear liquid should be used, after the dung has been soaked a few days. It can be diluted with water for various kinds of plants, if judged to be too strong. Better apply rather weak to all plants, and the grower be on the safe side. If Cosmos plants were growing in the garden last year, it is more than likely that numbers of seedlings are coming up, or even some of those which come up early are in flower. This is a useful flowering plant for the autumn, when it succeeds best. The yellow variety, Klondyke, is well worth growing, as it makes a pretty contrast to the other varieties, and is a very showy plant when in full bloom. Carnations will need attention should the weather be dry, and should be kept well supplied with water; otherwise, if allowed to want moisture, they may suddenly die off. The Carnation has become a great favorite, and many handsome kinds of the perpetual class can be obtained. Bouvardias, if well treated, will keep up a constant supply of flowers well into the winter months. As the flowers drop off, prune the flower-bearing branches, and apply liquid manure, and they will very speedily flower again. The Bouvardia is as useful a plant, with the exception of, perhaps, the tea-scented Rose, as could be grown in cottage or farm homestead gardens. Plants may be planted out in the early autumn, or else in the spring. If extensive autumn planting of evergreens is to be carried out, preparations should soon be begun. The autumn is the very best time of year to plant evergreens of any kinds, and it is also the best time to propagate cuttings of plants.

A GAY BED.

Here is a pretty filling for a small bed, preferably a round one, in a lawn. Thoroughly pulverise the soil, make the surface even and fine, then water it through a fine rosed can. At 6-inch intervals round the edge dibble in seeds of Nasturtium Queen of Tom Thumbs, putting two seeds at each place, and forming a double row, avenue fashion. This Nasturtium has deep crimson flowers and silver variegated foliage. Over the inner space sow Viscaria elegans versicolor sparingly; slightly cover with sifted soil, and then stretch black cotton over the bed to keep the birds off. The Viscaria is 1 foot high, flowers all the summer and most of the autumn, yielding innumerable blossoms which are salmon striped and blotched with carmine. It is a great improvement upon the older sorts of Viscaria.—M. H.

CHRYSANTHEMUMS.

Plants which were struck early in the season have done very well, and the buds have developed satisfactorily. Those growers, however, who delayed their operations have good reason to regret commencing in the spring. The tendency nowadays to retain second crown buds has given us plants much taller than was the case some years ago, and, in quite a number of instances, the plants are exceptionally tall. There is the promise—at least, from the collections of careful growers—of obtaining incurved blooms of exceptionally fine quality, and this can only be achieved by commencing the propagation of this type of the Chrysanthemum early, stopping or pinching the resulting plants, and retaining second crown buds, or those of even a later series. In the case of plants grown for decoration terminal buds may be retained, and, under ordinary treatment, blossoms from these for autumn displays. Terminal buds develop at a rapid rate, and, as the blooms from this bud selection are not by any means over large, they are invaluable for cutting. Their color, too, is usually good, and rarely are they known to show signs of damping of the florets. Keep a sharp look-out for insect pests. The earwig is one of the greatest troubles, often eating out the points of the tender shoots with the buds in embryo. Inverted pots with hay or paper in them, and placed on the stakes, are a capital and ready means of trapping them. The pots should be examined each morning and carefully lifted. They should then be shaken over a vessel containing boiling water, or any other equally efficacious fluid for destroying them. As bamboo canes are now used very largely for stakes, it is just as well to point out how they harbor the earwigs. Those bamboo stakes with hollowed out stems afford an excellent hiding-place, and old stakes may be slit down and often found to contain quite a lot of earwigs. For this reason growers should fill the hole in the top of the bamboo canes with putty or any other equally useful substance, and in this way minimise the risk of damage to the shoots.

Specimen Chrysanthemums are of two types—the large bush, 2 to 3 feet high and 5 feet across; the small bush, about 3 feet across.

The stem of the plant must show clear above the surface of the soil after all top-dressings have been put on; indeed, it is more satisfactory if the single stem is clear of branches for about 9 inches from the soil in the pot. Watering, top-dressing, and staking are more easily accomplished.

With regard to standards, a stiff, Mushroom-shaped head is not recommended, but one on a single stem which has branches grown in a natural manner, and simply secured to light stakes to prevent breakage. The standards should average about 4 feet 6 inches in height, according to the variety, grown in this manner. Extremely dwarf varieties would not be satisfactory for this purpose. A few plants only should be so treated and well grown, then they are beautiful objects for placing in greenhouse, conservatory, or entrance hall while they are in full bloom.

WATERING.

When and how to water plants is a question often asked by the amateur grower, especially ladies who have a few pot plants. There is no doubt the watering is the most important operation connected with the treatment of plants, and, alas, too often neglected. The first consideration is to have a method in watering, look over them every day, and see if they require it. If this is not done there is great danger of neglect. If the soil is too dry the roots cannot absorb sufficient moisture to counterbalance the evaporation which takes place through the leaves, thereby causing the plant to flag. If water is used too freely the soil becomes sodden and sour, causing the leaves to turn yellow. We shall understand better how to water if we correct first some impressions derived from old works on physiology. It is said that plants want water. This is strictly true. Water is found in plants, but enters rather in the shape of vapor. A soil that is wet will only grow water plants; and it is a remarkable fact that these water plants seem to have very little water in them. A reed or bulrush grown in water has far less water in its structure than a nearly allied species grown in dry land. The plants which have the most fluid in them are those grown in the driest places.

A wet soil is totally unfit for plant-growing. A plant standing twenty-four hours in water is oftentimes ruined.

A good soil for plant growing, therefore, is not one that will hold water, but one in which the water will pass rapidly away.

The soil itself ought to be comprised of minute particles through which air spaces abound. The water must be just enough to keep these particles moist; the air in the spaces is thus kept in the condition of moist air. The roots traverse these air spaces, and it is, therefore, moist air the roots want, and not water. If it were water wanted, we should cork up the hole in the flower pot. Instead of which the aim is to hasten the water away as soon as possible; for this reason we use plenty of drainage. A plant will generally be the healthiest, therefore, which wants water the oftenest, showing that there are plenty of air spaces, and that the roots are making good use of them. If a plant does not require water often it is in a bad way, and more will make it worse. How often to water will be according to how easily the water passes away. If, when you pour water on the earth, it disappears almost instantaneously, it would be safe to water such plants every day.

There are several methods by which to judge when plants require water. By general appearance of the soil or feeling with the fingers. By tapping the pot with the knuckles, the pot has a sharp, hollow sound when the earth it contains is dry, and a dull, heavy sound when moist. This can easily be practised by taking a dry pot and one recently soaked with water. Another plan is by lifting and testing their weight. When a plant is sodden it is like a lump of lead; practice will soon tell the difference. Never use cold water for plants in a room; always use it the same temperature in which the plant is growing. Never water a plant that is wet; but when dry give it a good soaking to thoroughly moisten the ball. If a plant gets very dry plunge it into a bucket of water; let it remain until the air bubbles cease rising to the surface.

If a plant doese not dry quickly, and appears to be in a stagnant condition, turn it out at once and examine the drainage and re-pot in a fresh pot.

GARDEN MANAGEMENT.

In his book upon "The Principles of Gardening for Australia" Mr. Bogue Luffmann has some very instructive and trenchant remarks upon garden management which should be of much use to those who like to see their gardens as they should be. He says:—

All-round gardeners, full of resource and possessed of great taste, are extremely rare in Australia. The cause is to be found in the absence of any systematic training grounds, for not one of our State botanical or other public gardens goes so far as to train its own employés, much less prepare gardeners for the benefit of the general public, and those who come from other lands are so convinced of the merits of what they already know that they fail to recognise and work in accord with the demands of local climate. Here and there one sees a garden well managed as the result of an intelligent gardener, but as a general rule the men employed may be designated garden robbers. This is not said unkindly, but so long as it remains unsaid we shall be begging and waiting for a more rational and better garden. We see no attempts to stay the robbing hand of our summer climate or any intelligent appreiation of the significance of the Australian garden.

Broom and barrow men they are for the most part, regularly reducing the garden area to unshapeliness and poverty Their principal work is sweeping up and carting off the vital foodstuffs and moisture-holding properties of the soil. To the eternal employment of the broom and barrow we may attribute no small loss of our soil and wasted efforts in other diretions. The industrious broom and barrow man is everlastingly looking for the opportunity to wheel something out of the garden. He has nothing like a corresponding inclination to bring stuff in unless it be manure. He calls certain stuff "litter" and "rubbish," as if all loose matter on the earth's surface were not manure, or soil-dressing, or a moisture-holding property, or a soil-deepener, or a shape-giver, or something else equally benefiting to our domain. Remember that every soluble and decayable item within your garden area has a perpetual right to remain there. We must have no actual clearing out; there may be occasional burning of disease-infected matter, but all else must be no more than transferred to a rotting and decomposing quarter, whence it may be brought back as soon as it is fit for use.

We have an extraordinary large proportion of one-man places, and this is an important reason why real skill and thoroughness are not more commonly displayed. The single-handed gardener is expected to be much more, and there will be no marked improvement in the character of local professional labor till the gardener is relieved from the multifarious duties of a domestic, and employed solely in the cultivation of plants and the beautification of house surroundings.

In brief, the working gardeuer cannot improve his position (which really means do better work) until his employer takes a more intelligent view of the situation, and, in association with the garden architect, provides a ground plan and body of material which will preserve fine effects without the employment of over much thought on the part of those doing the manual work.

The situation demands closer contact with the subject, and more skill in directing on the part of owners.

Where the garden is small and the working strength likewise, the owner should know as much as will ensure the necessary attractions at all seasons. Where the gardener is found to be interested in his work, able to recognise the possibility of every part, and can produce distinctly graceful dignified effects, leave him alone.

Where the domain is too small to fully employ a skilled gardener, and regular male assistance is required, it may be found advantageous to keep a youth for general work and bring in a capable man so many days a week as the garden demands.

The amateur who desires a neat and pretty garden at the expense of from 10s. to 30s. per week, should first of all, through the medium of a garden architect or professional gardener, secure a thoroughly appropriate plan, and then get this carried out. It must be evident that nothing fanciful or difficult to manage must be attempted where the labor will be rough and untutored. All the world over we should be able to say, "My garden is in accord with my means and my gardener's knowledge. It is appropriate to the situation, we understand all it contains, and therefore manage it well,"

Australian garden work is notoriously lacking in "finish," and it is as often painfully cheap. Hence the employer has constantly to see that the garden is not vulgarised by the employment of petty devices and weak method of planting and grouping.

Plants in themselves are never really common, but we may group or shape them with greatly varying effect. This is the real difficulty with the untrained mind and hand —that even where it thinks, it thinks differently. It thinks from cut a cottage or hideous mass of matchboard boxes forming a back street. Genius is sportive; but it is easy to decide whether we may expect most taste and effect in gardening from those who are bred amid the refinements of good homes and receive the general benefits of education, or from those who understand taste to be a sense confined to the human mouth.

Don't take your gardener on trust; don't think him wise and competent because he knows the name of every plant in the garden, but rather employ and encourage all you can the man who has unmistakably an eye and an inborn faculty for the work.

We have now to consider the ordinary demands of the different styles of garden.

Those architecturally perfect houses of the classical orders have gardens so precisely and permanently laid as to call for little more than the preservation of the original form. Special work in the way of renewing the soil occurs more or less often, that is, if the annual work does not regularly repair all deficiencies. The routine work in such gardens consists in keeping them full of soil and plants, and imparting as much additional "character" and dignity as the form and age of the entire estate admit of.

In managing the gardens assigned to houses of the Gothic, Dutch, Queen Anne, and many less definite styles of building, and which call for no severe and rigid style of garden, the routine work should provide a steady change of form and expression. It is true that many features may be regarded as permanently attractive and suitable, and that they will gather strength and beauty with the years; but there must from the very nature of the "free" or landscape style of gardening material (since all is alive), be rapid change of form and value, necessitating frequent alteration and improvement. There is always the danger of monotony where the scene does not reveal grand architectural effects or a variety of new forms and colors. In brief, as trees alter their shape and size, and as they interfere with views of each other, as they demand more or less room or soil, as we want new features about them, as they overawe and spoil grass, or make paths too dark or damp, or dirty, we must alter and improve them and their surroundings. Moreover, as we gain experience, we venture more; and again, our financial resources may be increased or curtailed, or we may require to use the garden for a slightly different purpose We discover wet, sour, thin, and over-exposed soil, badly lighted and extra rich spots; also plants encroaching, others failing, turf giving out or growing too rank; or the plan may be obviously expensive, or call for a less delicate class of plants. These are conditions which chiefly affect our work in managing the ordinary private garden composed entirely of vegetation.

(To be continued.)

CLIMBERS FOR HOUSES.

Probably all of us do not sufficiently recognise the fact that the beauty of a house depends largely upon the climbers that adorn it. An ugly building looks ugly no longer when it is creeper covered, whereas the prettiest or most handsome one requires some natural foliage decoration. There are a few simple rules as to planting climbers that, if followed, prevent mistakes. A red house must have no pink blossoms against it, a grey house must have no white ones, or at least bright colors must predominate at all seasons.

For a red brick house a white Cobea scandens makes a lovely and successful climber, while the purple Cobea may accompany it, or be reserved to show up grandly upon a white building. Eccremocarpus scaber can transform a square, dull-looking, grey house into a glorious spectacle, by the time the 10 feet high branches are laden with their orange scarlet racemes. On white walls and over porches the many varieties of the climbing Convolvulus will supply exquisite effects that are unknown by those gardeners who only grow these annuals in poor soil. To be seen at its best, C. major needs to be well grown for putting out, and must be carefully supported and generously fed.

Many a cottage owes its chief loveliness to the luxuriance of its encircling Japanese Hops and Nasturtiums, but these need not be regarded as fit only for small dwellings; they will give a noble show up large walls. The variegated Humulus Japonicus, with its cream, silver, and green foliage, is especially suited to old red brick houses. Above Nasturtiums, that dainty member of the same family, the Canary Creeper, can be trusted to look well, or a pleasing arrangement can be made by using only the climbing Nasturtium known as The Pearl, and some plants of the orange scarlet blooming, rapid growing Mina lobata will soon clothe the upper portion of the wall.

Clematis Jackmanii superba is a magnificently rich red violet, and is seen at its best against white, grey, or cream houses, though it will not be unpleasing on old red brick ones. For new red brick villas the pure white variety of C. Jackmanii is one of the very best of climbers. White buildings, again, are suited to embellishment by Star of India, a maroon purple with red lines in the blossoms, or Louis van Houtte (darkest violet purple), the velvety crimson Jackmanii, Madame Edouard André, or the mauve pallida. There are innumerable pale Clematises for use against red brick house fronts. The blue Clematises, bluish lavender strictly speaking, are lovely on all but grey buildings, toning equally well with red, cream, or white.

The more delicate varieties of Hedera Helix can be planted that they may become established before winter, so a wide choice of foliage climbers is before us. A north-west aspect is not too cold for most of them, while the north and north-east walls can be adorned by the hardy H. H. digitata, with its finely shaped dark green and white leaves, the cheerful looking yellow green H. H. canescens, the yellow and green H. H. angularia aurea, or the irregularly cream blotched vigorous H. H. marmorata. Against low built cottages or more ornate bungalows such climbers as Sweet Peas are often of sufficient height, and this means that the possible color effects are almost endless. Nasturtiums and Convolvuluses are also useful, and so are the perennial, pink, crimson, white, and blue forms of Pea. Tall Fuchsias, Geraniums, and Heliotropes may be trained against house fronts in summer, and the two first often survive winters.

ROSES.

For Walls.—Rêve d'Or, apricot and deep yellow; Climbing Niphetos, pure white; Climbing Kaiserin Augusta Victoria, creamy-white, a splendid rose; Reine Marie Henriette, light crimson, a well-known rose, sometimes badly attacked with mildew; and Climbing Perle des Jardins, golden-yellow, the next best to Maréchal Niel, which should succeed well if given a sheltered corner and not overcropped. If you would prefer Maréchal Niel, plant a half-standard of it against the wall, and prune back the first spring. Climbing Devoniensis, a grand old kind with flesh-white, fragrant blossoms of great size, should be allowed to ramble at will for a year or two, and then all the hard wood carefully laid in, pruning back the laterals only, save cutting out any worn-out wood. Waltham Climber No. 1, bright red, lovely in bud, is as regular in petal as a Camellia. Souvenir de Mme Joseph Metral is a splendid flower of exhibition size and of a cerise color. Lamarque, one of the favorites of bygone years, is even to-day unsurpassed, although very tender; the sulphur-white buds and blossoms are very beautiful. Jaunee Desprez is a free-growing and hardy kind, of mixed colors—red, buff, and sulphur. Fanny Stolwerck has coppery-carmine buds, open flowers yellow and rose. Noella Nabonnand bears huge semi-double flowers of velvety crimson color and exquisite buds.

For Arches.—For roses of better quality than the Crimson Rambler we name the following, the first seven being large-flowered kinds: Mme. Berard, apricot and salmon; Mme. Alfred Carriere, blush-white, distinct and beautiful; Celine Forestier, pale yellow flowers, flat, a well-proved variety of sterling worth; William Allen Richardson, unique in color, which is orange-yellow; Reine Olga de Wurtemburg, a semi-double crimson, almost evergreen rose of wonderful vigor; Marie Lavallée, a lovely semi-double flower of delicate beauty, rose and white in color; and Cheshunt Hybrid, which is not admired exactly when fully out, but the buds are pretty, color magenta. Any of the above would also be good on the walls. The following are grand Roses for arches, and although small in blossom, they make amends for this by their profusion: Electra, yellowish-white; Claire Jacquier, nankeen-yellow; Flora, pink and white; Euphrosyne, pink; Thalia, white. There is one Rose, not so very fast in growth, but indispensable on wall or arch, and that is Deschamps or Longworth Rambler; color bright carmine, splendid in autumn.

Whilst the climbers are making their growth plant between each pair some of the less vigorous Teas, such as Marie Van Houtte, Catherine Mermet, Souvenir d'un Ami, &c. They would afford a quantity of blossom. Such varieties will frequently attain a height of 8 feet to 10 feet on a wall.

PRUNING ROSES.

The Hybrid Perpetuals, Hybrid Teas, and, in fact, all roses not climbing, are pruned in spring. But there is such a thing as summer pruning of roses. With the Teas, Hybrid Teas, Hybrid Perpetuals, and all classes that flower again in autumn, it is a good plan to go over the plants and slightly prune the growths that have flowered. This consists in removing an inch or two from the shoots, cutting them down to the first plump bud. The work needs to be done very carefully, for we must not remove more foliage than is necessary, neither is it advisable to prune too low, as by so doing the bottom eyes are induced to start, and this would be a misfortune, as they will be required for next season. Scotch Roses, Rugosa, Austrian Briers, &c., are best left alone beyond thinning out the growths when they become too dense. Climbing Roses that flower again in autumn, such as the Teas and Noisettes, benefit considerably by a good thinning out of the weakly and old wood as soon as the first flowering is over, carefully preserving all sound, well-ripened growths, and spreading them out to admit light and air. Do not on any account shorten the long growths formed this season—at least, not at present. Next month they might have their points pinched out, which would tend to ripen the growth better. Rambler and other rampant growers of summer blooming habit are best thinned in autumn, and very little, if any, pruning is required in spring. Where such roses have grown luxuriantly they should be carefully taken down from their supports and overhauled, cutting out the old and dead wood and any that looks debilitated, afterwards carefully tying out the best young wood. It is quite true that one meets with old specimens that have, perhaps, received no pruning whatever, and they are a sheet of bloom. This is quite true, but if the plants had been well thinned from the commencement, the trusses of bloom would have been finer, and the flowers of a better color.

TWO CHARMING POLYANTHA ROSES.

The very interesting group of dwarf Polyantha roses is of comparatively modern introduction, one of the first varieties, Paquerette, having been introduced by Guillot some twenty-seven years ago. Their origin is supposed to be the result of crossing Rosa multiflora simplex with a Tea Rose. Now we have quite a charming group, two of the best recent novelties being Eugenie Lamesch and Leonie Lamesch. The former has tiny Ranunculus-shaped blossoms, orange-yellow in bud, prettily tipped with crimson, changing to pale yellow as they expand. It rarely exceeds 18 inches in height, and is, therefore, useful as an edging or for small pots. It was raised by crossing Aglaia with William Allen Richardson, and is a very remarkable hybrid, seeing that the two parents are very vigorous growing kinds. The great merit of this rose is its diminutive blossoms. One does not care to see the group developed into a large-flowering one after the style of the Tea Rose. Already we have some varieties that nearly approach the Tea; for instance, Mosella, which has flowers almost as large as Hon. Edith Gifford. This is a departure in the wrong direction. What is wanted is very tiny flowers in huge clusters of all the lovely colors seen in the Teas. Leonie Lamesch is vivid coppery-red, if the word coppery conveys any meaning. It is really an intense orange shading, which merges into a red, with terracotta edges to petals. There is no more remarkable rose in color than this one. The one fault of the variety appears to be its inability to expand well, the petals seeming to be marred at the edges. Leonie Lamesch resulted from a cross between two seedlings. Both kinds named above were raised by Herr Lambert, of Trier, Germany. Especially lovely are the snowy-white Anne Marie de Montravel and Schneewitchen, also another charming white, Katherina Zeimet.

ROSE WHITE MAMAN COCHET.

The popularity of this splendid rose increases every year. This season I think it has been the loveliest variety in our large collection. In White Maman Cochet we have a variety of vigorous growth and an abundant blossoming habit—good points in a garden Rose. As a white rose the variety under notice is superior for outdoor culture to The Bride, although that lovely variety is good in a sheltered garden. To obtain the greatest perfection of blossom in White Maman Cochet, and, indeed, all large Tea Roses, they should be upon half-standard Briers. There is something about the hedge Brier that gives character to these lovely Teas. The only disadvantage of having many of them is that they are not readily protected against severe frosts. Should the winter be severe it is an easy mater to cover with thatched hurdles or lean boards against the wall, previously covering the branches with dry fern or straw. I would advise all who can spare the time and have the means of access to country meadows to obtain some of the hedge Briers for themselves this coming October. They would find the work interesting, and one is sure of the Briers taking well if they are carefully planted the same day. A friend of mine obtained as many as seventy of these half-standard Briers in one day last autumn, and when I saw them recently they had made splendid growths, upon which he had budded the above rose and many others. The only fault in White Maman Cochet is a tendency to become divided in the centre, but this is not nearly so frequent in the white as in the pink form. I believe that both Roses should be grown in rather a light soil. They seem to grow too rank in that of a clayey nature. It has been suggested that the Rose does not require manure, but I differ. I am of opinion that some phosphatic manure is of much assistance to the large blossoms, although this should not be overdone.

Rosa.

ROSE CRIMSON RAMBLER.

According to my experience, no real success can be had in the culture of this rose without high feeding. It is of a very vigorous habit, making when established, growths some 20 feet long, but it will not bloom freely unless the roots get abundance of food from the time the plants start into growth. In planting, the soil should be well stirred to a depth of 3 feet, adding a good dressing of rotten manure, which will carry the young plants along very well for the first year without further aid. In following years a top-dressing of manure should be applied in the beginning of the winter, so that the plants get the benefit of it by the time they start into growth. In the case of good-sized specimens a heavy coat of manure will be necessary or any good concentrated stimulant will serve the purpose, not waiting, however, until spring, but applying it in winter, so that it may be dissolved and carried down a couple of feet into the soil. As regards pruning, very little will be needed for the first two or three years; in fact, it is better to let the growths remain intact for a couple of seasons. When they become very crowded, some of the oldest growths should be cut out, which will promote the formation of strong shoots from the base.—C., Byfleet.

VIRGINIAN STOCKS IN POTS.

This pretty little plant is generally grown in borders, the seeds being sown where the plants are wanted to bloom. But for pot culture they are a decided success; for, as a rule, the seeds germinate freely and the resultant seedlings blossom quickly. For windows of all descriptions the plants grown in various sized pots are most serviceable. But I particularly wish to draw attention to their use as pot plants for placing in small vases. Fill very small flower pots with ordinary fine loam after placing a crock over the hole in the bottom, and then sow a pinch of seeds on the surface, covering them slightly. The result will be a charming display of pretty violet-tinted flowers.—G. G.

CROSS-FERTILISATION OF THE EVERLASTING PEA.

The Everlasting Pea (Lathyrus sylvestris) is one of the finest and most ornamental of British plants. It is a climbing perennial growing in open spaces in woods, sometimes overpowering bounding hedgerow plants, and seen in all its glory is simply unique. Its peduncles of three to eight flowers, red variegated with pale crimson, violet, and tints of green, wings violet, bear the closest scrutiny; the leaves with one pair of lanceolate, attenuated, coriaceous leaflets, and all-clasping tendrils, the leaves set off with narrow stipules, and the stems winged, are extremely interesting to the lovers of Nature.

In the garden the Everlasting Pea is the form named L. sylvestris platyphyllus syn. L. latifolius, its many flowered peduncles of rose colored, relatively large flowers rendering it a general favorite as a very desirable hardy climbing perennial, and one of the most easily cultivated. It thrives almost everywhere, even in courtyards amongst flags and boulders. Thus any naked walls may be ornamented by inserting a few bits of it among the stones under the wall, these taking care of themselves, as the long, leathery roots penetrate to a great depth. There is a variety with brilliant rose carmine flowers, namely, L. s. p. splendens, but the finest is the pure white variety. L. s. p. albus is unsurpassed for cutting.

For dwarfing the Everlasting Pea and cross-pollination purposes mention may be made of the round-leaved L. rotundifolius, neater in habit, producing rose-colored flowers, peduncles many flowered. Sibthorpe's (L. Sibthorpii) rarely exceeds three feet in height, has rosy purple or deep mauve flowers, and blooms early.

For increasing the size of the flower crossing with L. grandiflorus is likely to produce something quite out of the ordinary, and when a break is thus made crossing the progeny with the Sweet Pea (L. odoratus) would render the Wood Pea far ahead of all the family for cut flower purposes, the flowers being very enduring. For getting length into the Everlasting Pea crossing with the most rampant of the family, L. Pyrenaicus, which grows 20 feet in a single season, and bears a prodigious quantity of blossoms of a yellow tint veined with purple, may give a form of Everlasting Pea for running over the trunk of dead trees and similar places, vying with the Traveller's Joy (Clematis Vitalba) in its festooning of trees. But the great desideratum is to get the scent of the Sweet Pea (L. odoratus) in the Everlasting Pea, and thus enhance the value for cut flower purposes.—"The Gardener."

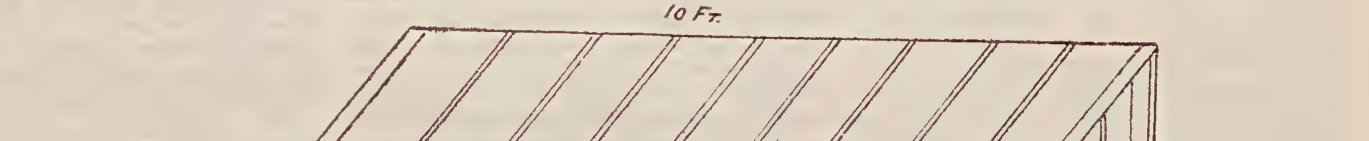
LIQUID MANURE APPLIED IN WINTER.

It is not generally known that Roses benefit considerably by copious applications of sewage or other liquid manure poured on the ground during the resting period. It is lamentable to witness the waste in some establishments of good liquid manure that could be used now as a fertiliser to beds of Roses. Lightly fork up the surface beforehand, then pour it on the ground, not immediately near the plants, but between the rows. The spring rains will take down the fertilising material ready for the requirements of the plants when needed. Such applications are safe, whereas there is always an element of danger in the indiscriminate use of liquid manure when the plants are growing, besides which the liquid is more readily applied now than later on. If a more reasonable method of manuring were adopted there would be no need to resort to doubtful artificial stimulants which appear so enticing in print, but which, if recklessly used, are a source of positive danger.—Rosa.

GLASS HOUSES.

[By Mr. A. McDonald.]

That glass houses are necessary for the propagation and culture of the finer kinds of flowering and ornamental plants I do not think will be disputed, as they are in general use all over the civilised world. I would, however, like to say that I am no advocate for coddling in greenhouses of plants that would be very much better out of doors, or that will do in a shadehouse; and I would further like to remark that there are few of our cultivated stove and greenhouse plants but what would be considerably benefited by a three months' spell in summer out in a shadehouse. I have a very strong opinion that many orchids, ferns, flowering and ornamental foliage plants, many of which dwindle away if kept constantly under glass, would be found to do well if treated in that way. Houses for plants are built of glass as it admits more light than any other material used in building, and light is absolutely necessary for the life and growth of plants; the exact measure of light required has not yet been scientifically ascertained, but the best practical men treat their plants to a very liberal share. For instance, the London growers for market, who of any class of men have to raise the largest number of healthy, saleable plants, always keep their plants well up in the light, close to the glass—that is a point they are most particular about; in fact, their houses are constructed so that the plants cannot be far from the light, being mostly small span-roofed, with a walk down the middle and tables each side. They avoid any large amount of empty space, as that does not pay, especially when the structures are heated. It does not seem economy to heat a large amount of space with nothing in it. Small houses for small plants—and large houses are only required for large plants. The development of glass structures for growing fruit and flowers round about London and all the large towns in Europe is something wonderful. We can form a sort of an idea about it; but I believe the reality would astonish us that have been out here for a considerable time. The demand for plants and flowers for table and room decoration has increased greatly of late, and their climate preventing them from raising much out of doors through their long winter, a great deal has to be done under glass to supply the demand, so that horticultural building has become a trade of very considerable importance. In a large establishment, for instance, belonging to one of the wealthy of the nobility or gentry you will find glass houses for forcing pineapples, peaches, cucumbers and melons, strawberries, &c., and houses for Camellias, Azeleas, Pelargoniums, Dendrobiums, Cattleyas, &c. It is, of course, a great advantage in the cultivation of plants to have a house for one particular class, as the house can be treated to suit the peculiar requirements of the plants better than where there is a mixed lot. In the large establishments which grow for market every available space has to be used to make the thing pay. In South Australia glass houses probably never will be wanted to the same extent as in the mother country, as a great deal more can be done out of doors and in shade houses. We have, I think, a good deal to learn about glass houses for our climate. What they will be mostly wanted for will be for propagation and growing of stove plants, and for conservatories attached to dwellings. As to the latter, I do not think that any rule can be laid down about them they will vary in accordance to the taste and means of the owners. Williams says that in England conservatories are generally perfect graves for plants, as they are mostly built to harmonise with the dwelling, and are not at all suited for plants. The plants dwindle away in them. The reason for this is generally a want of light and fresh air. People who are about to build conservatories, if they wish their plants to thrive, should bear in mind that no plant will do well if too far from the glass or too heavily shaded. The difference between one plant standing within a few inches of the glass of a conservatory and another a few feet away from it is in most cases very great indeed—the one will be strong and healthy, the other soft and sickly. Glass houses for growing plants should, in my opinion, not be too large. Small span-roofed, similar to those the London market gardeners and nurserymen use, are a very good sort. They are mede by digging a trench out about four feet deep and four wide to the required length.



This trench forms the path, and the ground level each side forms the beds for the plants to stand on. The side walls need not be above a foot high, but a house of this kind might be any height or width, according to the sort of stuff to be grown in it. Lean-to houses are useful as propagating houses for striking cuttings, raising seeds, &c. Cuttings are different from rooted plants. They do not require such strong light, so that the lean-to house, which only gets light from one side, is the best for them. The chief thing to be aimed at in a propagating house is to keep as even a temperature as possible for the year round; to keep them warm in winter, when the outside temperature is low, is easily got over by putting plenty of heating power in the house; to keep the house cool when the outside temperature is very high is not so easy. My views are, that in the first place the position of the house ought to be studied, and it should stand in a place where it would get mostly all the sun in winter, and as little as possible in summer. It should have a very large tank inside, which, if kept full of water, would have an equalising effect on the temperature of the house, and supply a little watery vapour to the plants when the outside air is dry. Further, I think that a perforated water-pipe might be run along the top of the roof, under the shading, and on our very hot days the water could be turned on to run down the roof and find its way into the tank. The water need not be wasted, as it could pass through the overflow and be turned to good purpose outside. I think an arrangement like this would have a good effect when we have severe weather in the way of hot sun and winds; and for propagating houses and houses with a lot of rare and valuable plants it would be worth trying. What we have to contend against most in this country is the severe heats, which come through the summer in bursts. We get on some occasions every summer a very quick rise in the temperature, and as rapid a fall. These changes affect tender plants and cuttings very much. What is wanted is a temperature varying from 70° to 85°, with a moist atmosphere. One idea that has occurred to me is to have double glass during say four months in the year. Houses might be built so that an extra roof of glass could be put on or taken off as required. I am not an advocate for double glass for the year round, but for the hottest part of our weather, when the air is so very dry and hurtful to tender plants, I think a double-glass roof would be a real benefit. The glass sashes forming the double roof could be utilised for pits and frames through the winter. It must be understood that I only recommend double glass for houses in which very tender plants are cultivated, and for propagating. The point to be aimed at is maximum of result with minimum of labor. I have had no great experience with double glass, but what I have had has been satisfactory. Houses for specimens may be of any shape, to please the taste of the proprietor, provided always that the plants will have abundance of light round about them, and not stand too far away from the glass. The span-roofed house with lantern roof for giving top ventilation is about the best kind of house that I know, but as it might be out of place in some situations, a house may be circular, semicircular, half-span, or any other shape, provided always that the principles of plenty of light and fresh air are kept in view. As an example of a span-roofed house for specimens, we will say that it may be 50 feet long, 20 feet wide, and 12 feet high, with lantern roof for top ventilation. I do not think it need be sunk. The brick walls may be about 3½ feet high, and the glass sides about 2½ feet. The ventilators for bottom air should be in the brickwork; the glass sides need not be made to open, and the pitch of the roof may be about the third of the width. The lantern roof considerably improves the appearance of the house, and it is the best mode of top ventilation at present known. The house inside should have a slate table or stage three feet wide, and standing up three feet from the ground all round the sides and ends. The paths may be from two and a half to three feet high, and in the middle of the house there should be a stage raised up, so as to keep the plants well up in the light. The space underneath the stage in the middle of the house may be filled up with a large tank for holding water; underneath the side stages should be the hotwater pipes for heating the house in cold weather. The pipes may be carried round the house, raised about a foot from the ground. I would have the whole floor of the house cemented, so that it would hold at least three or four inches of water, like a shallow tank, to be filled with water in hot weather. Gangways made of battens would have to be made for walking on along the paths and above the water. In winter, of course, the paths would require to be kept dry, and the tank in the middle of the house should have a covering of boards, to prevent as far as possible too moist an atmosphere at that season. In the depth of winter keep the house warm and dry, and in the heat of summer as cool and moist as possible. For the skeleton of the house I prefer iron to timber, it is not so clumsy. And I am in favor of good thick glass being used. Of course, expense will put a limit to the thickness of the glass, and I do not mean to run into extremes. My reasons for thick glass are that it is not so easily broken as thin glass, and is therefore more cheaply kept in repair. It quenches more of the rays of sunlight, and therefore less shading is required. Shading I look upon as a necessary evil. My opinion is that more plants die under glass from being heavily shaded than from all other causes put together. People build houses of glass to admit plenty of light, and they put on heavy canvas shading to darken them up again. It should be borne in mind that the entire life of the plants depends on the action of light on the cells, which contain chlorophyll. If that scientific truth is admitted it must be bad to shade heavily, as you prevent the necessary rays of light from reaching and entering the plants. On the other hand, few plants will stand the bright glare of the sun through glass, especially thin glass. A good shading material is much wanted; I think, more so in these colonies than in England—we have to get shade here so much more than they have. We want something that will admit the rays of the sun to a certain extent, and that no burning or scorching will take place, and it would require to be strong enough to withstand our rough winds. Heavy canvas blinds I must condemn, for when they get black with soot and dirt they are a perfect abomination. My opinion at present is that in winter, except for propagating houses, no shading is required; but the glass should be kept clean and clear, so as to admit every ray of light possible. As the season advances a little frosting may be put on—not too much. When we begin to get the sun very strong, say in November, a little more may be added. It should be of such a substance that the rains, when they come, would gradually wash it off. On the return of winter the glass should be washed clear again to admit all the light possible. Propagating houses will require a little shading even in winter. Heating of plant-stoves and other glass structures is a subject that has received a very considerable amount of attention in England and elsewhere, and it cannot yet be said to be perfect, the chief object aimed at being to get the most heat out of the fuel used. In this country, where we get so much more natural heat than they get at home, people are inclined to say that not much artificial heat is required, and it is certain that there is not so much required as in a colder climate; yet I consider it true economy to have an efficient heating apparatus even in this country. It is a mistake in the culture of tender stove-plants to let the temperature fall too low in the winter. T. Baines, writing on Dipladenias and Alocasias, says the temperature must be kept up to 65° at night in winter, and for young growing plants he says it ought to be 70°. That statement I must endorse, if you wish your plants to grow into value. They may struggle on and live, but you never can see the beauty of tender stove-plants if they are subjected to a too low temperature in winter. No amount of attention will make up for the want of that element. The plants are natives of parts of the world where it is always warm, and very little difference between the hottest and coldest time of the year. For that reason they are not adapted for low temperature. The general mode of heating plant houses in the present day is by hot water circulating in pipes. Our forefathers used to heat their houses with the smoke flues, and I have never been able to understand why they have been done away with altogether. I do not see why the two systems should not be combined. A great deal of heat which now goes up the chimney and is wasted could then be utilised. Much has been said and written about boilers, and a great many different kinds have been patented by inventors. It would be a difficult matter for any one to say which is best. The saddle-backed boiler is an old sort, and I think it is as much used as any other even at the present time. There ought to be plenty of piping, so that you do not require to have the pipes too hot to keep the house up to the required temperature. When only a small amount of piping is used, the pipes, to be of any service in keeping up the temperature, must be got up very hot, and it is a bad sort of heat for plants that comes from the pipes when very hot. Then there being such a small quantity of water, it is apt to boil, if not very closely watched, and throw all the water out at the supply cistern, scalding plants and filling the house with steam when it should be dry. Then the cold air gets into the empty pipes, and the house gets cold and the plants suffer, and the whole object of having a heating house is frustrated. On the other hand, if you have plenty of piping, it holds more water, and boiling can hardly happen if the circulation is right. You get a more mellow heat; having more surface throwing it off, there is no necessity for having the pipes very hot, and the object is gained. If a thing is worth doing it is worth doing well. Ventilation is an important matter in the construction and care of plant houses. Well-rooted plants require plenty of air, or they languish; oxygen seems to be as necessary for them as for animals. On the other hand, a plant with its roots in a bad state will not stand in an airy place; it begins to flag as soon as it comes in contact with fresh air. In a closer atmosphere it would look all right. We put cuttings under a bell-glass to strike root; if the glass is not removed after they have rooted you will find they die off. The reason is they are suffocated. The roots as soon as they are formed begin to perform their office, which is to take up nutriment from the ground; the leaves then want to breathe, which they cannot do if kept too close, and the young plant dies. It follows then that abundant ventilation is not wanted for propagating and nursing houses, whereas for houses filled with well-rooted plants it is required. All that I would go in for in a propagating-house would be a little top ventilation; but for specimen-houses I would have abundance of it, top and bottom, taking care that there would not be any cold draughts striking on the plants. Tanks.—I think it a pity that any one should build a stove or greenhouse and not put a good water-tank inside. Rainwater is generally allowed to be the best for plants, and the quality of the water has a good deal to do with success in plant-growing. Besides, I think it desirable that there should not be too much empty space in a greenhouse or stove in this country. In summer you want to be always damping the floor to keep things right, whereas if there was a good big tank in the house, full of water, it would act better and save labor. The tank in a stove should have some of the hot-water pipes passing through it to keep the water above the temperature of the house. I have found this to have a most beneficial effect on the atmosphere of the house, and it supplies tepid water for any watering required.

HYACINTHS.

The cultivation of these lovely flowers is almost universal, for their exquisite coloring and rich fragrance make them general favorites; but, on the other hand, they are not always so fine or so well grown as they might be if their needs were better understood. The sturdy foliage, above which the stately spike should stand, and the perfection of each individual bloom on the specimen here represented are only seen where there has been no check to the growth of the plant from its earliest stages.

Many amateurs obtain their bulbs too late in the season, when they have been lying on the shelves of a warehouse for many weeks, during which time their vitality is lowered, and they lose the power of starting strongly. All bulbs should be planted as soon as they can be procured, and those who send a list of the hyacinth bulbs required to any good firm early in September will be in time for all the varieties, the early Roman hyacinths being the first to come to hand.

These graceful blossoms, in pure white, are more like our own wild hyacinths (Scilla nutans) in form than those usually cultivated in pots. Slight and delicate, the Roman hyacinth is equally charming for table decoration or for growing in quantity to provide cut flowers in winter. The bulbs are best grown in a well-drained box of spent soil, 8 or 10 inches in depth, placing each bulk 4 inches from its neighbors, about half-covered with soil. After a thorough watering, the box should be covered with a layer of clean moss (which has previously been dipped in boiling water to destroy all insect germs), and over this fine coal ashes to the depth of 4 inches. Ashes should not be allowed to come in contact with the bulbs, as they sometimes receive injury from noxious gases left in the ashes; but if these have been allowed to lie in the open air for a few weeks they lost all taint of injurious gas, and may then be used without an intervening layer of moss. Standing out of doors, in a warm sunny corner, the roots of the hyacinths will quickly start; and in a month or five weeks green shoots will be visible on uncovering the bulbs. They should then be removed to the greenhouse, and will bloom early with gradual forcing, plenty of tepid water being necessary from the time they are placed under glass. As soon as the white tint of the bells can be seen those bulbs which are most forward should be raised, when thoroughly moist, and potted, placing from three to five bulbs closely together. For cutting, this is, of course, unnecessary, but many charming arrangements can be made in bowls of ornamental china with these flowers. A group of Roman hyacinths, surrounded by scarlet Van Thol tulips, and edged with blue scillas, is a very pretty arrangement of the national colors.

Directly after the Roman varieties, the beautiful Italian hyacinths open, taller and with fuller bells than the earlier blooms, in pale lemon, blush pink, and blue. These are rarely seen, yet they are most elegant, and should be cultivated in the same way. The blush pink variety is, perhaps, the most attractive, but all three are distinct and charming.

The double and single hyacinths of the larger-flowered class, now in bloom, are also potted in September or October, and kept, covered with ashes, &c., in a sunny position in the open air until they show a green shoot above the bulb. But they need at least six weeks to form their roots before growth begins, and they will not bear so much forcing as the early flowering hyacinths, gradual increase of warmth, with ample supplies of lukewarm water, being necessary to secure early flowers with stout foliage. The single varieties are the more suitable for pot culture, and also for growing in glasses for room decoration. In order to succeed in this plan of cultivation, specially firm, solid bulbs, which have not been kept too long out of the soil, should be selected, and a suitable hyacinth glass can be filled nearly to the top with clear rain water. The bulb should not quite touch the water when placed in position, and it may be necessary to add sufficient water, keeping the bulb and water a quarter of an inch apart before the roots begin to grow.

Placed in a dark, cool cupboard, or buried in a box of clean moss or jadoo, the light must be excluded from both bulb and glass until the roots are at least 3 inches long, when the plant may gradually be inured to the light, and in a week's time should be placed in a sunny window, as near as possible to the glass. Anything like strong forcing will result in weak, weedy growth, and must not be attempted; but the sunshine and a temperature of about 60 deg. will soon enable the blossoms to open properly.

In adding water the bulb should not be raised or shifted, the water should be lukewarm, and if it become necessary to change the whole of it (this only being needed if it should become thick and impure) it is not desirable to take the plant completely out of the glass. A few small bits of charcoal in the water tend to keep it pure, but in many cases they appear to be unnecessary.

Hyacinth bulbs, after flowering, are often thrown away, but those who have a garden should plant them at once (without allowing the foliage to droop) on a rock border, or as an edging to the herbaceous border, for, if well treated, they will produce many small spikes for cutting during the following spring; and if their flowers are cut and the roots richly mulched with old hotbed material each year in spring they will increase in size until, in three years, fine blooms are again produced, which are very useful to raise (just as the blossoms are opening), arranging them in fresh moss for the room, in groups of several plants, with maidenhair fern, thus prolonging the hyacinth season by some weeks.

For the balcony, for beds, for filling window boxes, and in many decorative arrangements hyacinths are very effective, and, as they can be transplanted so easily, it is desirable to have a plentiful supply of them.

Prince of Wales is a fine variety, in an exquisite shade of pink; Mont Blanc is of the purest white, with large bells; Lord Derby is a magnificent blue flower; Ida, one of the best of the yellow varieties; L'Innocence, white, has a very fine shape; Black Diamond is one of the darkest, and Kohinoor is pale apricot in tint.

Many others equally good may be selected from the catalogues of our leading horticulturists (such as Messrs. Carter, Messrs. Barr, Messrs. Sutton, &c.), for potting and for glasses; hyacinths for bedding are usually selected, in quantity, by their tint and not by name.

The giant Hyacinthus candicans (syn. Galtonia), from the Cape, is a handsome plant for the herbaceous border, where it will increase and multiply year by year. The white flowers it produces are not, however, in proportion to its height, which is about 5 feet.

The Alpine hyancinth (H. amethystinus) is quite a contrast to the last-named plant, for it is a little gem in soft blue, only 6 inches high, which makes a charming edge to a border in spring.

The Muscari group of hyacinths are very hardy, and not at all particular as to soil. The grape Muscari "Heavenly Blue" (introduced from Trebizond by Mr. Bar) is extremely brilliant in color, and also fragrant; M. Armeniacum is also good; and M. azureum blooms with pale blue flowers. The yellow musk hyacinth (M. moschatum flavum) bears fine spikes of bloom, and is quite a contrast to the blue varieties; whilst the tassel hyacinth (M. comosum) is very singular in appearance, producing a tassel of deep blue on each flowering stem.

The ostrich-feather hyacinth (M. plumosum mostrosum), too, is quite unlike the rest. This old-fashioned flower has no distinct petals, the whole blossom resembling a curled blue feather.

Then the scillas (to which group the wild hyacinths belong) are quite a large family, although the Siberian squil (Scilla Sibirica) is well known for its habit of early flowering and rich blue tint. This bulb, with the beautiful Chionodoxa Sardenis (the Sardinian squill), should be grown by every one, for its exquisite coloring is not too common, and the bulbs multiply themselves most satisfactorily in the garden, contrasting delightfully with yellow and white crocuses or dwarf early daffodils. The chionodoxas may be distinguished from the Siberian squill by their larger size and silvery white eye, and their color is the blue of the nemophila. C. gigantea is the largest of the species, but the flowers of this plant are in clear lavender, very delicate, and pretty. None of the squills will bear much forcing, and if grown under glass they must be kept as cool as possible.

Besides these early dwarf scillas we have many wood hyacinths, as well as the wild S. nutans; and these graceful plants are very useful in a shady spot, where few blossoms will open. Even under the shade of pine trees, where nothing else will grow, these bulbs flourish; and they can be placed in groups between shrubs which exhaust the soil too much for ordinary plants to survive amongst them.

The Spanish variety (S. campanulata) is specially strong in growth, with flowering spikes, which are erect; S. campanulata rosea is in pink, and S. aperta has striped blue and white petals, whilst S. alba is in pure white. The rose color and white varieties of S. nutans and the pyramidalis scillas are all beautiful, too, and are too seldom seen in our gardens.

Scilla autumnalis is the latest variety. The Japanese autumnal scilla is very handsome, with rich pink bells; the Peruvian scilla (Peruviana) grows to the height of 1 foot, with large heads of dark blue flowers; and the Italian variety (S. Italica) is in pale blue. Blue flowers are never to be seen in superabundance, and, indeed, many gardens lack this lovely color almost entirely; so that it is specially desirable to add to our collections any plants which will produce blue blossoms; and when perfect hardiness and the power of flourishing under the most simple cultivation is found in one plant it is indeed a treasure in the garden.

Half-wild nooks, woodland paths, or a position under a north wall may all be decorated with these graceful hyacinths, which seem to defy all the difficulties of want of light or soil, under which most other plants would quickly collapse.

I. L. Richmond, F.R.H.S.

DOUBLE PETUNIAS FROM SEED.

Petunias are great favorites with many people; especially so are the exquisitely beautiful double varieties, on account of their delightful perfume. There are now a good many fine-named varieties in cultivation which must, of course, be increased by cuttings; but it may not be generally known that these plants are as easily raised from seed as any other soft-wooded plant. Seed should be procured from a reliable seed firm, and although a good many of the plants will produce single flowers only, a good strain may be relied on to produce from forty to fifty per cent. of double flowers of great size and exquisite beauty.

Sowing the Seed.—As a rule petunia seed is sown too late to get the plants as large and strong as they might be, and although the seeds germinate more readily if placed in a slight bottom heat in a warm house, such treatment is not absolutely necessary; for if sown in August, and the pots or pans are placed on a shelf in a warm house, the plants so raised will not only be much less soft and tender, but will be much more short-jointed, and consequently at flowering time will be more floriferous and altogether better in every way. The seed is extremely fine, and the greatest care is needed to get the soil perfectly smooth and level before sowing. The compost used should be fine and of a sandy nature, and may consist of about equal parts loam, leaf-mould, and sand sifted through a quarter-inch sieve. The seed is so very small that it is better to water the soil with a fine rose watering pot before sowing, then to sow thinly, and cover with a very slight sprinkling of fine silver sand. I like this material for covering all very minute seeds, as it can be seen better than sifted soil how much is put on. Whether the pan is placed in slight bottom heat or on a shelf, the greatest care is needed to keep it shaded from the sun when bright, and water should only be applied when necessary, and then through a very fine rose watering pot.

Potting On.—As soon as the young plants are large enough to handle they should be transplanted to other pans or boxes of light soil, similar to that advised for sowing the seed. Fairly good drainage is necessary, and although care should be used in watering the seedlings in a young state, they should never be allowed to suffer for want of water at any time. The very smallest of the seedlings should be treated with the greatest care, as these invariably produce the best double flowers, the strong seedlings often turning singles only. When the young pricked out plants have become fairly strong and well rooted, they should be transferred singly to three-inch pots, to be again shifted on till the flowering stage is reached. The soil for this and subsequent potting should be richer, and four parts loam, one part leaf-mould, one part old mushroom bed manure, and one part sand will form a suitable compost. The pots ought to be fairly well drained, and after the first potting the soil should be made very firm, taking care, however, that the soil is in the right condition as to moisture.

General Treatment.—Petunias do not like much heat, and a warm greenhouse temperature is the most suitable. It is also very essential that the young growing plants are always kept well up to the light. They are all the better transferred to a cool frame or pit, where they can be stood on a bed of moist ashes. Liberal supplies of water at the root will be required, and when the flowering stage is reached, the pots being well filled with roots, frequent applications of weak liquid manure or soot-water will be very beneficial. Just as the flowers are expanding, a slight sprinkling of artificial manure applied to the surface of the soil will greatly assist in bringing them out to the greatest perfection. Petunias, being brittle plants, need careful staking as growth proceeds, and it is advisable to occasionally pinch all strong growing shoots till the plants are to flower.

Insects.—With the exception of green-fly, insects are not very troublesome to petunias. Green-fly or aphis is easily destroyed by an occasional fumigation with one of the self-acting fumigating materials.

WINDOW BOXES

No matter how beautiful are the window boxes themselves, or the plants that grow in them, the success of the whole effect must depend upon its harmony with its surroundings. For instance, brilliant Carnations, pink double Geraniums, or magenta Petunias, in bright emerald green boxes, against a new red brick house, will be ugly! Again and again do we see pink flowers placed near red brick, while cold-looking blue and white ones, which would have suited the position excellently, appear against a grey or white dwelling, where they are depressing and colorless.

If gold, yellow, orange, scarlet, warm bright mauve or purple, pinks of all shades, with a little white, or preferably cream, are kept for all red buildings we shall make no mistakes. The red houses can have plenty of white or cream flowers, lemon, gold, lavender, blue, and even scarlet or a deeper cardinal shade.

Sometimes an artist gardener has found all his work spoilt by the objects placed inside the windows, the outsides of which he has carefully made lovely. I have seen a house of dull grey color brightened up splendidly by a magnificent window box show of pale gold, scarlet, and cream; but the inhabitants of that stately residence had put a jardiniere in each of the lower windows which was filled with magenta and white striped Petunias and deep pink Stocks and Asters.

It occasionally happens that a house is ugly because its windows are too long and narrow; if so, it is often possible to set up boxes that are rather longer than the sills, or at least jut out well beyond the casements. If climbers are grown at the boxes' ends, trained either over hoops, up pillars of bamboo cane, or up the wall itself, the ugliness will be entirely cured. When windows look too broad for a small house, the boxes can be rather too short for the sills, and have some tall plants at each end.

For a cottage or rustic style of house of any size, boxes covered with natural wood, or stained to represent dark wood, or made of deal set all over with fir cones and well varnished, are most artistic. The ordinary villa may have tiled boxes so long as garish colors are not chosen. Plain white tiled boxes look well against a red brick building; plain wooden boxes painted dull, or brownish dark green, are also quite suitable.

The grey, cream, or white painted houses are not difficult to suit with window boxes; there is nothing claiming rustic treatment about them, and varied effects are admissible. Orange tiled boxes, holding white flowers and crimson variegated foliage plants, are pleasing by grey walls; cream walls will show off turquoise blue tiled boxes filled with amber and brown flowers, such as French Marigolds, or pale yellow ones with white; even scarlet window boxes can be safely used against white walls, and their filling should consist of deep green foliage plants and pale lavender flowers.

For white and cream houses, pink boxes will do well with mauve or lilac flowers and crimson foliage plants, such as Coleuses or Beet; while lemon and white Iceland Poppies will be successful against either.

The plants that droop over the boxes are the cause of many failures that we witness; unless they are luxuriant they look very miserable, and seldom make an even line of color. A light festooning of drooping greenery is often a great improvement to an arrangement that is otherwise stiff, and the Kenilworth Ivy, Linaria Cymbalaria, is quite the best plant to make use of.

All color and no foliage is an effect to be avoided; even if white flowers predominate over gay ones, green is wanted. It is a mistake to let bare soil be visible; there are so many dwarf plants that can be bought or raised from seed that a carpet of green, brown, gold, grey, white, or any color is easily obtainable beneath the other flowers. Pyrethrum aureum kept cut, Sedums of several sorts, Mesembryanthemums, Pinks, Lobelias, Nemophilas, Sweet Alyssum, Aubretias, Cerastium, and Campanulas, are a few of the suitable subjects. Light growing annual grasses have a charming appearance among flowers in sunny window boxes—dwarf Cornflowers or Iceland Poppies, and Briza gracilis or Agrostis nebulosa, for example.

AZALEAS IN SUMMER.

When the gorgeous Indian Azaleas have yielded their crop of flowers further interest in the plants is frequently lost, and they are relegated to some obscure corner of the greenhouse until the season of blooming again comes round. Should they then fail to flower with expected abundance, the owner expresses astonishment, and straightway enlists in the ranks of the apparently increasing army which is perennially enquiring in the gardening press, "Why do my Azaleas fail to bloom?"

Now, instead of so treating the poor, long-suffering Azaleas; instead of swelling the ranks of this undesirable army, why not treat the plants more rationally this year? They do not ask for much in return for their wealth of blossom; why not concede their modest demands? Why not carefully remove the faded flowers and seed pods, examine the perhaps choked drainage, and top-dress or repot the plants as the state of their growth and size of pot dictate?

This done, stand the plants in a position in the greenhouse where they will not be overlooked when the water can is on its rounds, and where they will fully share in the refreshing dew which the syringe dispenses thrice daily.

To mature the growth, stand the plants in a fully exposed cold frame, laying a mat or other light shading material on the glass if the sun is very hot and the leaves are very close to the frame top. This shading is only necessary for a few days, after which full exposure should be given, with the frame lights opened to their fullest extent.

An alternative to frame treatment in summer is to plunge the pots in ashes in a sunny spot outdoors. Let the ashes reach to the rim of the pot, and see that some are put beneath as well as round it. Watering now will not be a heavy task, but must be carefully and thoroughly attended to, as must early morning and evening syringings of the foliage, especially noting that the undersides of the leaves get well wetted.

HARDY FLOWERS.

CENTAUREA MONTANA GRANDIFLORA.—Most of us know the old typical blue and purple Centaurea montana, as well as the white and red forms which have so much value for cutting. The one can be grown almost anywhere—in sun or in shade, in rich soil or poor soil, flourishing contentedly nearly everywhere, and giving a long succession of flowers if the older ones are cut ere they fade. Now this old form bids fair to be superseded by the new variety called C. m. grandiflora, which has larger flowers of perhaps greater value for cutting, the plant being also a little more vigorous. This plant is so easily propagated by division that it is already offered at a moderate price, and in time, if a demand for it springs up, it ought to be plentiful.

EUPHORBIA PILOSA MAJOR.—The Euphorbias, or Milkworts, are never particularly popular plants, but it must be remembered that there is among them a certain proportion of good hardy plants. Some are only greenish, others are a greenish-yellow, while others, again, are of a wonderfully bright yellow, a few, in addition, being tinged with red. A certain number are good rockery plants, and there are others, again, which may be used with advantage either for the border or rockery. Among these one may give a good place to E. pilosa major, which is to be met with frequently among collections of hardy flowers exhibited at shows by nurserymen, but is seldom seen in the garden of the amateur. It has rather succulent-looking, glaucous green foliage, and a number of yellow flower heads on stems of 1 foot or 1½ feet high. These are afterwards touched with red, which adds to the general effect. It is easily grown in any soil, and seems to be of a better color when grown in sun than in shade. It is increased by seeds or by division.

HEUCHERA BRISOIDES FLAMBEAU.—There appears to be no end to the production of new Heucheras. Endeavours ought to be made to try to secure with the freedom of flowering of H. brizoides the bright coloring of H. sanguinea, which is so disappointing in many gardens. Some of the newer Heucheras are wanting in brightness, but among the best is H. b. Flambeau, which I flowered here last year for the first time. It has nice dark foliage, and makes a pretty plant in the garden at any time while in growth. Its flowers, in good spikes, are of a bright rose, tinted with violet, and are on stems 2 feet or more in height. I have come to the conclusion that these Heucheras like a better soil and a moister position than they often receive when planted on a rockery. In a good border they will attain dimensions and a vigor unapproachable in a poor and dry soil.

MULGEDIUM PLUMIERI.—Mulgedium or Lactuca Plumieri is one of the bold and effective hardy plants which are hardly suitable for the flower border, but may well find a place in the wild garden, or in some corner where its effective appearance and bold character would be of service. It owes much of its value to its leaves; while on a tall stalk, well raised above its basal leaves, it produces heads of pretty blue flowers. In general appearance it reminds one somewhat of the Thistles, and, in consequence, it has acquired the name of the Blue Thistle. It is closely allied, however, to the Lettuce, and is considered by many good botanists that it is more appropriately named Lactuca Plumieri than Mulgedium. It is a hardy plant which can be readily cultivated in any soil, but it is in a good, heavy one that it really attains its full dimensions of 8 feet or more. It is easily propagated by seeds or by division.

Pulmonaria Arvernensis alba.—As spring-flowering plants the Pulmonarias, or Lungworts, are not to be despised, and the various colors of blue or red they give are of a different character from most of the other blooms of the season. The nomenclature is not always satisfactory, but even in the case of the one under notice, whose name is not authoritative, one must keep to it, seeing that it has no other. It is a distinct dwarf plant, flowering in spring, with heads of neat white blossoms. It is all the more valuable, seeing that it will thrive in a place which is in almost perfect shade. It has not been long in cultivation, and was named by the finder because of its native habitat. On the lower flanks of a shade rockery it looks well.

S. R. Nott.

PLEASANT CHAT.

CROSS FERTILISING CARNATIONS.

Those who grow Tree Carnations and have a few good blooms to spare should try a little hybridising. To my mind, nothing gives more interest and pleasure than to watch a batch of seedling Carnations which the grower has fertilised, harvested, and grown into flowering plants. One never knows how rich a prize may be in store in a batch of seedlings, and to gain as many treasures as possible it is well to start properly. Select some promising looking buds, making sure that the stem and calyx are perfect and the plant is healthy.

When the flowers are half-open is the time to commence operations. The calyx should be split on one side and the immature anthers removed—this is done to avoid self-fertilization. There is nothing more to do then but to wait until the flowers mature and for the stigmas to become ready to receive the pollen. When the flower has attained to full maturity the stigmas are usually well developed, having assumed a hairy and moist upper surface. The operation of fertilising the flower is very simple. A well developed flower that has been carefully selected is taken, and the pollen dust, which should be perfectly ripe and dry, is then carefully rubbed over the stigmas by bringing the two flowers together. Another way, and the method adopted by most people, is to apply the pollen to the stigmas with a camel hair brush, but the safer method for a successful cross is the first mentioned. If the operation has been well performed the petals and the stigmas of the fertilised flower will wither up in the course of the day and fertilization will be complete.

The pod (or ovary) will begin to swell in a few days, and the only thing to do is to guard it against injury until it is ripe. The withered petals should be cut away and the calyx pulled down to prevent water from lodging round the seed pod. In from six to seven weeks the pod will have assumed a brown color; it is then ripe and should be cut off with a piece of the stem and put in a cool airy place to dry, after which the seed is carefully removed and either sown immediately or put away in small boxes or envelopes until required, keeping a true record of the cross.

MANETTIA BICOLOR.

It is on rare occasions that one meets with this beautiful climber, which is certainly too little known. It is of easy culture, and one which repays any little trouble entailed. Secure a few cuttings from healthy plants, placing three around the edge of a 3-in. pot in a compost consisting of equal parts of loam, leaf mould, peat dust, and silver sand. Place the pots in a propagating case, giving a good watering to settle the soil about the cuttings; keep close, only admitting a chink of air for an hour in the early morning, until rooted, when they may be allowed a freer circulation of air, and finally placed on shelves in a warm house.

After they become thoroughly rooted pot singly into 3-in. pots, or if larger specimens are desired pot the three on into 5-in. pots. Use a somewhat rougher compost than advised for the cuttings, with the addition of a pinch of chemical manure. Grow on in an intermediate house, applying the syringe twice daily to prevent the attacks of insect pests. Thrips are very fond of these plants, and when they appear fumigation must be done at once, or disfigured plants will be the result. Once fairly established, they should be placed in a position where it is intended they shall flower. Up a rafter in a warm greenhouse they will flourish admirably, producing their scarlet and orange flowers in great profusion; trained in this fashion, it is a very pleasing sight when in full flower during the dull days of winter. It may also be trained on a wire balloon, all that is required being the regulating of the growth to cover the framework evenly. Another very effective and accommodating way in which to use this climber is to train it up 3-ft. bamboo canes, clothing the stake regularly from top to bottom in a rather loose manner to avoid a ropy appearance. In this style they make admirable pot plants in the stove or warm greenhouse amongst dwarfer plants, and may also be taken to the drawing-room if desired.

As a plant for table decoration, Manettia bicolor is difficult to surpass; long sprays cut and placed on the white cloth form excellent tracing material, or the single pips dotted amongst sprays of Asparagus or Smilax draping the candelabra, leave nothing to be desired. I may mention that the plant requires liberal feeding when confined in small pots.

HOW TO GROW VIOLETS.

If we wish to have a good supply of Violets during the winter and spring months no time must be lost in starting. The stronger and more vigorous the root the more flowers the plant will bear; therefore the sooner the runners are planted the longer time will the roots have to obtain their vigor and strength.

Any one who has a garden frame may have Violets in bloom from October to June. In May or June secure good, strong runners and peg them down at a joint in good soil, and pinch off the runner beyond (these young plants will give much finer flowers than old roots). When well rooted they must be transplanted to a bed on a shady border, and supplied with plenty of water all through the summer months.

At the beginning of September they must be transferred from the bed to a frame. A hotbed should be made, and the frame placed on this. About 6 in. of good light soil should be placed in the frame, and the young plants placed about 9 or 10 in. apart. Be very careful to lift the plants with a good ball of soil, and thus cause the least check possible. The heat of the hotbed should be about 60 deg., and should also be lasting. This can be obtained by placing linings round the frames and covering them during cold nights with mats. The frame should be placed so as to receive as much sunshine as possible, and on bright afternoons the plants should be syringed, and always have a little ventilation. These will flower towards the latter end of October. Never force them, as the less they are forced the longer will they flower.

Of the different varieties, La France is one of the largest of all the giants; it is very compact and vigorous in its habit of growth. The flowers are dark blue, very sweet smelling, and borne on extra long stems. It has received an award of merit from the Royal Horticultural Society. The Neapolitan is also a very good one to grow.

DELICATE AND DELIGHTFUL DAHLIAS.

As there must be many readers who have not yet tried the pretty little Pompom Cactus Dahlias, possibly some who have never even heard of them, I take this opportunity of recommending the same to their notice. For decorative purposes the elegant, delicately poised blossoms are unequalled by any members of the Dahlia family, and few other garden denizens could afford to give them much start in the decorative race. There are not at present many varieties in cultivation, but Dolly, Fairy, Midget, Meta, Coronation, and Iona are six worth trying.—E. J. C.

The Orchard.

OPERATIONS FOR JANUARY.

By W. J. Allen.

Those who have applied manures will derive the full benefit from such applications. Weeds are making such luxuriant growth that it will be necessary to keep the soil well stirred so as to keep them under, and also to prevent them robbing the trees of the nourishment which they require for the proper maturing of their fruit. In districts where irrigation is practised it will be found necessary to give all fruits a good watering this month. As soon as the ground is dry enough after such watering put the scarifier to work and get the ground up to a fine state of tilth. This work should be done before the ground becomes hard and cracked, the best time to commence being just as soon as the horses and cultivator can work without the soil sticking to the implements and horses' feet.

All fruit intended for drying should be allowed to hang until thoroughly ripe, when it may be picked, cut in halves, placed on the drying-trays, fumigated as soon after as possible, and then either put out into the sun or into the evaporator to dry.

It may not be amiss for me to mention here that the Blue Oil Emulsion diluted in the proportion of 1 gallon of oil to 40 or 50 gallons of water is as cheap and effective a remedy for black aphis as any of the many sprays which are continually being experimented with.

The blue oil should be emulsified by thoroughly mixing in three or four gallons of boiling water and soap in the ordinary way, and then, when there are absolutely no particles of free oil to be observed floating on the surface of the creamy compound, the water for diluting can be added. Blue oil, or crude kerosene, in direct contact with peach trees will do injury to the foliage, and perhaps kill the tree. As an emulsion properly prepared no harm will result.

EXPERIMENTS IN SPRAYING.

The Experiment Station Record of Washington contains particulars of spraying experiments at South Haven.

With a number of the fruits comparative experiments were made to determine the relative value of dust and liquid sprays for the control of insects and diseases. A thorough test was made of these two methods on apples and plums for curculio and brown rot. Generally speaking, the cost of preparing and applying the dry Bordeaux mixture according to station methods was more expensive than liquid Bordeaux. The dry Bordeaux, however, could be applied in about one-third less time, and upon very rolling, hilly locations one horse could do the work of two or three. The liquid spray could be used with or against the wind, while the dust spray could not be used against the wind at all and was most effective when there was little or no wind and the foliage was wet from dew or rain. In no instance did the dust stick as well as the liquid spray.

Both methods gave excellent results in controlling the codlin moth worms in apples, and dust-spraying, using formula No. 1 [lye, sulphur, copper sulphate, and Paris green], proved superior to Bordeaux mixture and arsenite of lime in controlling the curculio in the plum orchard, and seemed to control the brown rot fully as well. Upon very close observation it was found that the fine particles of dust would stick to the waxy bloom of the fruit, while with liquid, unless very heavy with lime, the solution would run off of the plums as though they had been greased. In summing up the results obtained in this season's test, it would not seem advisable to change from the older method to the new, until the latter has been further tested, improved, and perfected, except upon plums and cherries.

In order to determine the effects of heavy rain immediately after applying copper sulphate solution for peach-leaf curl, the trees in one experiment were thoroughly drenched with pure water an hour after the solution was applied. No difference was observable in the amount of leaf curl on trees drenched and on those not drenched. The conclusion is drawn that the action of copper sulphate in destroying the spores of the leaf-curl fungus is almost instantaneous. As a result of tests for a number of varieties of cover crops for orchards, it is stated that vetch has proved one of the most valuable plants for cover-crop purposes ever tested at the sub-station. Clover came next in value.

Vegetable Garden.

OPERATIONS FOR JANUARY.

By W. S. Campbell.

If the season is dry, vegetable-growing during this month is a difficult matter; but if wet, or moderately so, many varieties of vegetables are likely to thrive excellently. Where facilities for irrigation are available, there need be no want of vegetables at any time of the year.

Insect pests are often prevalent during the hot months of the year amongst some of the vegetables, chiefly aphis and caterpillars on cabbages and other members of the cabbage family, and not infrequently it is most difficult to raise any of these plants when aphis appears in extraordinary numbers. It is said that sulphur, dusted amongst the leaves of the cabbages, will prevent the attacks of both caterpillars and aphis.

Beans, French or Kidney.—Should dry weather prevail and irrigation be impossible from want of water, the beans are not likely to thrive; but in those districts where the rainfall has been good, this vegetable should be yielding plentifully. Old plants, which have fallen off in production, had better be rooted out, and then the ground can be well manured, and cabbages, leeks, or any other seasonable vegetables can be planted or sown. The application of a heavy top dressing of farmyard manure between the rows of beans, as well as of other vegetables, should be of considerable advantage to them during the hot summer months.

Broccoli.—This member of the Brassica, or cabbage family, is closely allied to the cauliflower, and probably but few persons could recognise a difference between them. The heads of the broccoli are generally smaller than those of the cauliflower, and have a more yellow tinge; the leaves surrounding the inflorescence too are more numerous, and the broccoli is generally considered to be more hardy than the cauliflower. Sow a small quantity of seed where it can be well attended to, either in box, seed-bed, or seed-pan. On no account allow the soil to become quite dry after the seeds start into growth, or germinate. A shade had better be used. An old bran bag or chaff bag, cut in two and fixed on any rough sort of frame, would answer splendidly as a shelter and sun-break, under which seeds can be raised. Under such a protection the soil is likely to keep fairly moist. A mulch of finely broken up dung, spread over the surface of the seed-beds, will be a still further advantage and protection.

Borecole, or Kale.—Sow a few seeds during the month. This is as good a vegetable as anyone could grow for winter in the cold climates, for it will stand very cold weather indeed without injury. It does not seem to be grown nearly as much as it deserves. Nearly everything has to give place to the everlasting cabbage, which, though excellent vegetable as it is, should not be altogether depended upon, when there are so many good vegetables allied to it, and some of which succeed better under various conditions.

Cabbage, Cauliflower.—Follow the advice given above for broccoli. Seedlings of any of the Brassicas should be pricked out into well manured beds as soon as they are large enough to handle. Here they should grow into good strong plants for the final planting. Plant out any new plants that are strong and hardy enough to stand the shift. Water well before shifting, and water well after planting; and if but little injury has been caused to the roots they are not likely to feel the shift.

Celery.—A sowing of seed once during the month should suffice for requirements. Advanced and suitable plants may be planted out, but it would not be worth while going to this trouble unless a good supply of water be available.

Cress and Mustard.—Most useful for summer salads, but these plants need good supplies of water and occasionally some liquid manure. Sow seed, sufficient to give a supply, say about once a week.

Onion.—A trial of a little seed might be made where the season has hitherto been favorable for vegetables. Onions which are already growing should be well looked after and kept free from weeds without heaping or drawing any soil over the bulbs as they form.

Parsley.—A little seed may be sown, if any plants are required.

Peas.—In cool districts a few rows should be sown, and it is very probable that they will succeed satisfactorily should there be sufficient rain during the time of growth.

Radish.—Sow seeds two or three times during the month—a little at a time—in order to keep up a constant supply of a few radishes. Make use of this vegetable whilst it is young and tender, and discard all large overgrown roots.

Spinach.—Sow a little seed of this useful vegetable, which does not seem to be as well known as it should be.

Tomato.—Ripe fruit should be plentiful by this time wherever the season has been satisfactory, and the rain or water supply sufficient. Examine the plants occasionally for unsound or diseased fruit, and destroy such fruit by fire as soon as possible. If any plants are needed, seed may be sown, or young plants already raised may be planted out. Gather all fruit as soon as it ripens, and do not leave any to rot on the ground.

Turnip.—A little seed may be sown in drills occasionally.

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Correspondence.

Mr. L. H. Howell, of Mount Victoria, New South Wales, writes to say that last season he sold every bulb of his mixed Gladioli, and that the 20,000 mixed seedlings advertised are all grown from seed selected only from the fruit blooms, and every one of the bulbs will bloom in from 12 to 14 weeks after planting. The new bulbs offered are not the tiny little bulbs about the size of a large pea, but are from 1 to 2 inches, plump, and full of vitality, and every bulb will grow.

We can verify the foregoing statements from our own growing of Mr. Howell's bulbs.

The Flower Garden

OPERATIONS FOR FEBRUARY.

[By J. Cronin.]

During February the most important work in gardens, particularly those in dry districts, is watering and frequently stirring the surface, to prevent evaporation, and maintain as low a temperature as possible in the soil. A thorough soaking of water should be applied, and as soon as the surface soil is dry it should be broken up by the hoe or cultivator.

Where water is scarce the ground should be mulched with stable litter containing plenty of straw, which is one of the worst conductors of heat. In the warmer and drier districts, the first consideration should undoubtedly be to keep the soil cool and moist, however unsightly the means to do so may be for the time being. This unsightliness may be greatly mollified by scattering soil enough to cover the mulch of straw litter, weeds, or whatever material is available, and also prevents the mulch being dispersed by the wind.

Light waterings should not be applied overhead on hot sunny days.

A smooth, even, well-pulverised surface is a necessity in the summer cultivation of garden land generally, preventing the formation of capillary tubes in the surface soil, and the ensuing loss of moisture.

Temporary rough shelter should be erected over plants that suffer from the direct rays of the sun. This applies particularly in the case of young plants that have been raised in frames, etc., and where plants have not made sufficient growth to shelter the stem and soil near it. In a suburban garden some fine plants of Daphne Indica rubra are grown that are shaded during the summer months. Before the shelter (which consists of a few light boughs or tea tree, fastened on a rough frame slightly larger than the plants) was provided they failed to grow satisfactorily, but are now fine specimens, flowering splendidly in season. There are many desirable plants that fail to thrive in some districts, owing to need of some such shelter that can easily be provided and removed when it is no longer required.

Chrysanthemums should be securely tied to stakes as they grow; where fine blooms are desired all lateral growths must be removed as soon as they appear, leaving only the few shoots (from three to six) that were selected from the first break in November to form the plant. Most Chrysanthemums break into lateral growth four times during the season, owing to a flower bud forming in the point of each shoot. After the plant is formed, only the leading growth bud should be allowed to remain to continue the growth of the shoot. During February the third break into side growth occurs, and instead of allowing the growth shoot to continue, all growth shoots should be removed, leaving the flower bud only, which is rounded, and occupies the centre of the point of the shoot. This is known as the crown bud, and produces the finest bloom in almost all Chrysanthemums. Care should be taken to remove the lateral growths as soon as they appear with a sharp pointed knife, and not to damage the flower bud. Begin at the top of the shoot, so that if the flower bud is injured another shoot may be allowed to grow, which, when matured, will only produce flower buds. These should be thinned, leaving only the central one in the point of the shoot, which is known as the terminal bud, and which, in some varieties, produces the best flower, being higher colored and not so full as those from the crown bud. After the crown buds are grown as large as a pea, liquid manure should be applied to achieve the best possible results. Cow or horse manure liquid, with, occasionally, a solution of sulphate of ammonia at rate of 1 oz. to 4 gallons of water, is the feeding generally used by successful exhibitors; which feeding should cease as soon as the blooms are half developed. If these suggestions are carried out, and a few plants are grown naturally near by, it must bring conviction to the grower that there is a deal in intense culture, and the principle will probably be applied more generally than at present.

Dahlias should be securely staked, and the growths tied up as they develop, thinning and regulating the shoots to prevent crowding. If fine flowers are desired the buds should be thinned also, and liquid manure applied as recommended for Chrysanthemums, together with a liberal supply of water. Should red spider attack the plants, the symptom of which attack is a change of color in the foliage as if it was scorched, the plants should be thoroughly and frequently hosed or sprayed with water, specially on the under parts of the foliage.

After Carnations have finished blooming the old flower shoots should be removed and the plants layered. This is an easy and certain method of propagation, whereby strong plants will be available for autumn planting, that will bloom freely the following spring. Carnations should be replaced every second year, in fact, some varieties, such as "H. Plumridge," the best dark crimson tree Carnation, are replaced each season by many florists. The "tree" or "perpetual" section are by far the more popular and useful than the spring blooming kinds, flowering throughout winter when bloom is specially valuable. The blooming period may be extended by cutting some of the plants back in the summer.

Roses should be thinned, any weak shoots in the middle of the plants being removed, and shoots that have flowered shortened back to a good bud. A good watering about the end of February will start the plants into strong growth, and ensure a good autumn flowering. Many of the finest Tea and Hybrid Tea Roses are seen at their best in autumn.

Ground should be prepared for planting Daffodils and other winter and spring blooming bulbs and corms. The soil should be deeply worked, and some well-rotted manure mixed through the lower portion.

A batch of Gladioli may be planted in February for autumn blooming. These will not come into flower until the hot winds are over, and are very effective.

Among the finest autumn flowering bulbous plants are the improved types of Amaryllis belladonna, of which blanda, magnifica, and major are probably the best.

Brunsvigia multiflora and Josephinæ are magnificent in bloom, and are closely allied to the Amaryllis.

Lycoris aurea (golden yellow) and radiata (crimson) are specially beautiful, as are several Nerines.

Other bulbous plants that may be planted about end of February are Ixia, Lachenalia, Watsonia, and Tulipa. Watsonia Alba is the best of the genus. Tulipa Greigi is the finest tulip grown here.

Ranunculus and Anemone roots may be planted in February.

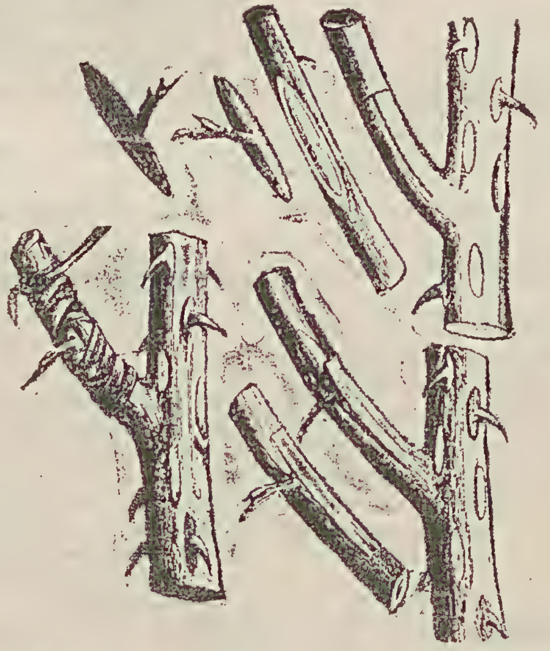
Seeds of Pansy may be sown in boxes. They must be well shaded and watered, and if planted out in March will bloom early and continuously during winter.

Iceland Poppy may be sown, and treated as the Pansy. There are several shades of color in these Poppies, and they are splendid for table decoration.

Sow seeds of Balsam, Calceolaria, Cineraria, Cyclamen, Pansy, Phlox, Primula, Mimulus, Petunia, Godetia, Iberis, and Lobelia; and make cuttings of Antirrhinums, Pentstemons, Carnations, Petunias, Zonal Pelargoniums.

BUDDING ROSES.

It is not at all difficult to secure the proper kind of wood for budding the Hybrid Perpetual and many of the Hybrid Tea Roses, but the true Teas require careful watching as the eye or bud quickly starts into growth, and is then not so suitable.



We always prefer shoots that have blossomed or upon which the flower is opening. They are then in their best condition, and you should experience no difficulty in removing the wood. Upon established plants the eyes or buds of both Teas and Hybrids do not start into growth nearly so quickly as they do upon young or maiden plants. One may obtain suitable wood from most kinds, even after the flower has opened several days, but in some cases it is necessary to take them even before the flower is fully expanded. The shoots must not be so dry that they require soaking, and this is never necessary excepting in very rare cases. We have inserted buds even without removing the wood at all, and they have "taken," but we do not commend the practice. It is most important for successful budding to see that the stocks "run" well—that is, the sap should be flowing freely. It is useless to bud if the bark does not open freely. The safest method to adopt to remove the wood from the bud is to press the thumb nail of the right hand into the wood just above the eye, and with the left hand raise the wood and pull it towards the right hand, when it will snap off near where the thumb nail is pressed. Now change the bud into the left hand and raise the wood from the other end. It will then come out easily, and leave the germ of the eye or bud intact. Cut a few shoots of a common Rose or Brier and practise this removal of the wood before you commence budding. If the shoots are in the proper condition—that is to say, half-ripe—you will soon be able to remove the wood without difficulty. Do not insert any bud where there is a hole left beneath the bud after the wood is pulled out, as this is a common cause of failure. There should be a small portion of wood beneath the eye about the size of a pin's head, which in reality is the germ of the bud, and it is of vital importance to see that this is not removed.

MULCHING FLOWER BEDS.

Too much stress cannot be laid upon the importance of this work, and the advantages accruing from the process are always apparent. Apart from the fact that less watering is required, the ground is kept open by the mulching, and plants are enabled to withstand a long season of drought and hot sun with impunity. This more particularly applies to such subjects as Violas, Pansies, Perennial Phloxes, Calceolarias, and Fuchsias; but it would be difficult to name plants that do not receive direct benefit from it.

About a month after the planting has been completed is a good time to perform the operation, thoroughly loosening the soil to a depth of 4 in. before applying. This is an important detail, and I sometimes think it would be a good thing if a prominent notice were fixed on every amateur's garden gate: Keep the ground stirred between growing plants or crops.

The surface will remain open for a couple of months. How often one sees the soil in the beds and borders of amateurs' gardens with a surface not far removed from concrete form. There is nothing better than short decayed stable manure from spent hotbeds for mulching.

GARDEN MANAGEMENT.

[By C. Bogue Luffman.]

(Continued.)

The garden once established, there is frequently occasion to remove some tree or shrub, or to re-employ some space for a totally different class of vegetation. As for example, when a garden is first planted, soft-wooded and quick-growing flowering plants are usually set quite close to the permanent trees and shrubs; but as these spread and shade the ground the others disappear. After a time the big permanent plants will provide a set of conditions within their shade suitable to another group of plants, and if advantage is taken of this fact there need be no untidy or bare spots in the garden, no matter what its position, character, or size. We must be steadily altering and refurnishing the weak and least effective spots. The garden thet is ever the same is invariably hideous. We should desire and provide for change in shape and expression, otherwise all the years will seem the same, and yet not so, since weakness will surely come upon the garden if our work does not amount to an annual refreshment.

Humor as much wayward growth as the situation will admit of, and carefully avoid keeping the garden with a young and over-precise face; but, on the other hand, always stir and enrich its soil, and prune such things as will ensure all being strong, clean, and happy in their surroundings. Never forget that great waste is always going on wherever plants are growing freely, or the surface of the ground is exposed to sunlight and air in motion. Once a garden attains to maturity it wastes soil very rapidly, and if the waste is not met by bringing in at least a corresponding amount the plants and general form of the place soon decline. The garden really loses its shape and quality through what may be termed natural waste (greatly assisted by the broom and barrow man). Surfacing from old pasture lands, road scrapings, and farmyard manure are the most accessible and appropriate materials for keeping up the quantity and quality of garden soil.

It is always seasonable to repair a fault, but normally, soil dressings should be given in autumn and winter, and manure dressings in spring. The latter will then provide a protective mulch during the summer and be ready for digging during autumn.

The proportion of capital to be spent in raw material is a point of vital interest and cannot therefore be over-emphasised. It is a rich and abundant soil rather than intelligence in the routine work which secures fine gardens. Whatever the annual sum to be spent in the garden, see that soil and manure are obtained, sufficient to keep each part shapely, and rich enough for the plants grown.

Of course no uniform sum or scale of costs can be given, since every position and year will bring its own special demands; and again, in some gardens, soil dressing is secured to certain parts by taking from others which are over-rich, and where the removal of material will also improve the form and effect of the area.

Garden management must be considered quite apart from knowing how plants grow and how to shape and arrange gardens.

Our real skill and success is shown in our ability to "keep up" a garden at all seasons. When a place grows untidy we have more than our purse, or taste, or industry can support.

Big alterations not only impose considerable extra labor and expense, but also waste a season or two, and once a garden is made, it should (when necessary) be altered by such small degrees that the ordinary routine work of the other portions is not sacrificed.

Good management implies a knowledge of—

(a) All the varied qualities, aspects, depths, and values of the soil composing the whole domain.

(b) All the ordinary cultural and climatic demands of the plants composing the garden. This involves a good knowledge of the influence of the seasons, as they affect soils and plants, for there will often be found summer and winter quarters for plants of one kind in the same garden.

Unless the gardener knows approximately the seasons and conditions under which roots and wood, and flower are produced, he cannot shift, dig round, manure, water, put to rest, prune, or cut down, with certainty of success.

The heaviest work of the year on garden beds and borders occurs after the heavy frosts and rains of midwinter have destroyed the last vestiges of life and beauty in the soft-wooded and short-lived plants which go to make the garden gay in summer. What are termed "mixed borders" are invariably composed of trees and shrubs, roses, soft and hard-wooded permanent plants of small size, herbaceous plants, bulbs, and a small number of things of a more or less nondescript character.

Order of working—

1. Cut the adjacent turf hard down with a scythe to prevent its being trodden and rotted by the tramping it will receive in cleaning and re-arranging the border. If a path adjoins, weed and clean it first, and avoid putting heavy dirt or wet litter on it.

2. Pull up or cut down all dead stalks, and remove litter to a place where it can be deeply dug in, or rotted for future use.

3. Prune, thin the wood of, or cut down or out such plants as need it.

4. See that drainage is perfect, and, if not, correct it.

5. Provide new soil or manure, or examine and grade existing material to ensure a nicely-balanced surface.

6. Re-group such shrubs and permanent plants as will improve effect.

7. Divide and lay out herbaceous and miscellaneous plants ready for inserting when digging.

8. Deeply dig to true form the entire surface, filling vacant sites with many small plants as the work proceeds.

In spring there will be more pruning of such things as flowers during winter, clearing off weeds and litter, additional planting, and digging in accord with the nature and conditions of the soil. The mulch should not be put on till the spring sun has warmed and sweetened the earth.

The remodelling of old or neglected gardens is comparatively easy work, excepting where a new house has been placed on a different site and has thrown the trees and other permanencies out of line and perspective. A very careful survey of the whole area is necessary so as to get an exact knowledge of the quantities and values of all the different materials. Respect every fine tree or shrub, every bit of old wall or strong hedge, or creeper-covered space, and well-formed lawns. The defects of levels will be soon apparent, also the indispensable lines for paths, views, etc.; and these decided upon, material will be moved or recomposed to bring each part into a proper relationship with the rest.

Re-trenching of heavy soil and manure dressing are invariably necessary when an old or neglected garden is taken in hand. Trees and big shrubs may often be found in distinctly faulty positions, but it will pay to let them stand until more plants grow up on more appropriate sites, when the offenders may be removed. We should never cut down more of the trees than are absolutely necessary to provide a site for the house and lines of approach—since privacy and protection are the very first needs in every home in a hot climate.

The hotter and more exposed the soil in summer the greater the necessity for covering its surface as a means to stop evaporation and waste. Closely-packed beds and borders do not in the long run lose as much food and moisture as those which are the openly planted and exposed to the wasting influences of sun and wind. It is true that certain species of plants will not thrive when closely hedged in by others of a different nature, but for all such plants as go to form the general stock in beds and borders — including roses—dwarf-growing annuals, and even permanent creeping plants, may cover the ground, and whilst conserving food and moisture, add greatly to the general effect. There is no real beauty in soil. A bulky and well-worked mass impresses the gardener because he knows what he may reasonably expect from it in the near future; but once see the soil well prepared, and allow for the sweetening and food-yielding effects from the exposure to light, heat, and air, it is time to cover its face with something more distinctly alive and beautiful. In close planting the point is to have plants of varying size and chafactor. Cold, wet soils need plenty of exposure, but loose and shallow soils need close planting and covering up in summer; all wind-swept soils call for very close planting.

Beds containing Roses, Azaleas, Bouvardias, Ericas, or similarly cultivated plants should be covered only during the heat of summer, as the roots of the permanents are liable to suffer from sourness in the soil due to want of light.

One should have a packet of mixed seeds, containing Convolvulus, Mignonette, Phlox Drummondi, Dwarf Nasturtium, Poppies of sorts, Petunias, Marigolds, Portulacas, and other similar quick-growing things, and as the summer advances, and bare or weak patches show, scatter a few of these seeds. It will be an easy matter to remove those which are liable to injure stock plants. Of course when systematic planting is done for the summer these casual plants would create wild disorder, but as systematic planting is, very properly, rare in Australia, we find real beauty and satisfaction, wherever there is an abundant vegetation over all the surface.

The water supply is, next to the nature and quantity of the soil, the most important item in connection with the management of a garden. All said and done, gardening is entirely governed by ways and means. Water is distinctly expensive, and even where one does not object to paying for it, it may not be forthcoming in sufficient volume at those seasons when it is most needed. In every case we must make and manage according to the water supply. In this connection water is used in inverse ratio to quantity of soil. The deeper and richer the soil the less water will be needed, and the less work and anxiety regarding the preservation of the garden; therefore soil and water are considered together. And remember, that a shallow and rich soil, with abundant water, will never yield the superior garden which results from a great depth of well-prepared soil.

We are accustomed to spend money in watering in the summer only, when it would often be found much less expensive and better to water in autumn, winter, or early spring, and secure a well-saturated subsoil, which, quickly covered with vegetation, would be conserved and sustain plants at very small further outlay during summer. Watering at any season implies good drainage; it is especially necessary when given during the cold period of the year. Summer water does not "get down," since the soil and atmosphere are so hot that all water is quickly converted into vapor and thrown off.

In winter the rains are not sufficient to thoroughly saturate the subsoil, and even where the rainfall is high, established gardens are so screened by their own vegetation that the soil remains dry as dust all the year round, unless artificially refreshed. We have, therefore, to be constantly on the alert to note the effect of all the phenomena of nature, and in a general way we should do a good deal of work in winter, of a kind which, under other skies, would be reserved solely for the summer months; finally, it will be found infinitely cheaper to water in winter than in summer all those areas which call for heavy and quick-growing vegetation during the hot months of the year.

Those who discuss, and are very fond of particular plants, rarely have gardens.

The gardener cannot afford to make any special choice. It is as if an artist should say he would paint only in blue or red, or contend for one shape and size. Our garden is made up of an infinity of shapes and sizes and colors, and much affected by a great deal that is not alive or within our grasp, as the outside world (terrestrial or celestial). These impress themselves upon our garden and ourselves, and compel us if we are sane to listen to their united voice.

We must remember that there is a trade side to plant-growing, and that novelties are a necessity to every man's catalogue. But with novelties we shall make no garden. Many plants are of very short duration, or die off and leave a gap in the summer (this is a very serious defect in a flower). We ought always to know, when we put out a plant, when it will normally fail in beauty, or die, and if it be in summer, then we should anticipate the vacancy by planting something else near.

"Common" hardy plants will make a garden, and as we grow in knowledge, or means to buy knowledge, in the shape of skilled gardeners, then we may improve our collection.

The shade garden, wilderness, or covered shady walk should be found in every garden; it need not interfere with the extent or value of the more open parts, nor will it be difficult to make or maintain. If the dry, hungry ground under trees and big shrubs is deeply dug in winter, then well watered, and if poor given a top dressing of new soil, a great variety of shade-loving plants will be found to thrive and yield endless beauty, besides adding to the size of the garden enormously. Winding, unpretentious paths, such as beaten ways in woodlands, should be cut through big shrubberies, or such belts of trees and shrubs as follow boundary lines. The trimming up of the branches of occasional trees will admit as much light and air as will secure free growth and charming vistas. The shade garden would prove a welcome addition throughout the hot regions of Australia. This includes all the capital cities, and the oldest and most neglected gardens hold most material for the skilful remodeller. The shade garden means nature, or it means nothing. All growth must be prodigal and wild. Flowers will not be so rare, bright foliage so wanting, or the air so still and cold that the shade garden will in winter prove a dreary affair. Shafts of light are made to fall where a splash of color is wanting, and narrow windings, now opening to the sky, and now leading to broad carpets and vaults of varied green, keep one interested and secure.

Even where a few trees or shrubs are placed against a solid background, the soil at their base may be covered with creeping and low-growing woodland plants. In brief, we must waste no space, as ("in the economy of nature there are no fallows"): we are sternly reproved when we essay to improve on nature, and yet leave the greater part of the ground exposed and unattractive.

The natural forces acting against Australian garden work are to be found in extremes of climate, which severely try the constitution of most plants, and render them liable to disease, pests, and irregular growth. Excessively-heated and badly-drained soils furnish extremes beneath the surface, and demand such attention at all seasons as will prevent any wide difference in soil temperature. Hot, drying winds, droughts, poverty and shallowness of soil, and the disproportion of the wasting and gathering seasons, are defects to be met in various ways. By recognising the causes of each and all of these adverse forces we are in a position to give such attention to the soil and plants as will secure a wholesome abundance at all seasons.

If you would have a good garden, first learn to work, then work to learn. A superficial and theoretical knowledge is useless, since real hard work, calling for muscle as well as brain, has to be put into each foot of ground if it is to yield up anything worthy the name of beauty.

Of books, those which have most literary charm are most helpful to the amateur, since they create a mood which is inspiring and more definite in its aim than books which are mere catalogues of plants and directions for managing them.

The general effect of climate on the position you wish to deal with should be fully grasped; also the climate and position as it affects your health and desires.

Well-made public and private gardens, which appeal directly to the æsthetic taste or imagination, will be worthy of study, and in some measure of imitation. Every local beauty which has come into existence unaided by man will be a clue, which, followed, will lead to some appropriate effect in the garden. Make yourself thoroughly familiar with the characteristics of the local climate, get the best local calendar of garden operations, and write in all your experiences and impressions regarding your own work. This calendar should soon be found in one's head, and the possessor should usually be reading a few weeks or months in advance, so as to anticipate and provide for each season's demands.

THE GOLDEN BELL AS A BUSH.

The graceful flowering, deciduous Japanese shrub Forsythia suspensa is fairly well known as a covering for walls and house fronts, but is rarely met with in bush form in the open garden. When so grown, however, and its leafless flower decked shoots are seen against a background of some evergreen, there are few plants, at its time of flowering, to equal it. Every garden should possess it, as its cultivation and propagation are of the simplest, the latter looking after itself, as the shoots that reach the ground take root if the earth is moderately loose, and for the former any well-manured ordinary soil, deeply dug, will suffice. Grown naturally, the form of the plant is most pleasing, yet it can be restricted in growth to suit almost any nook by judicious thinning of the shoots. The flowering shoots last well when cut for house decoration.

LILIUM AURATUM.

This lovely bulb is comparatively little known to cottage gardeners. So generally uncommon is it that where it happens to be seen the beautiful flowers immediately arrest attention, and people invariably ask what they are. According to a paragraph in a recent number of "The Florists' Exchange" it would appear that Australia is not the only land where these lovely blooms are not appreciated as they should be, and yet they grow as easily as the common garden Lilies so well known to everybody. Mr. Herbert Hemming writes as follows regarding the bulbs in America:

The annual importations of Japanese lilies have recently come into port, and are now being distributed to different parts of the country. Although L. auratum, speciosum roseum, album, Melpomene, &c., are imported annually by the thousands, they do not seem to become any the more common in gardens. This is especially true of the first mentioned. Unlike L. Harrisii, longiflorum and other bulbs used for forcing and then thrown away, they are usually planted in gardens with a view to permanent occupation to increase and multiply, so that one would expect, if the plants are at all suited to this country they would be more in evidence.

The usual experience with Lilium auratum is to plant the bulb, which very often does not grow, and if it does to throw up a flower stem, but fail to make roots, with the inevitable result of exhausting the bulb without attempting to form a new one to flower the succeeding year. Why the bulbs do not form roots could, perhaps, be best answered by those curing them for shipment. It is more than likely caused by the roots being cut off before the bulbs are rolled in the moist clay and dried ready for shipment, as they are apparently ripe and sound when received.

Ever since the introduction of this magnificent lily it has been conceded to have rather a poor constitution, and to require special treatment; at the same time, judging from the writers of a number of years ago, it does not seem to have the same vigor as formerly. It is evidently succumbing to commercial methods, and needs the fostering care of the old-fashioned gardener.

Henry A. Bright, writing in the "Gardeners 'Chronicle" in 1874, says: "In the flower garden the finest bed is one which I have now had for the last three years. It is a bed of Lilium auratum, with dark heliotrope growing in between. I take up the lily bulbs for the winter, bring them on in heat, and then plant them out. They are really beautiful, and each year they seem more vigorous. Some have four blossoms, some have six or eight, and one has as many as ten. The strong perfume lies heavy on that end of the garden, and I think this lily should never be brought inside the house. It is curious how the blossoms vary; in some the golden stripes are so much deeper, in some the dark claret spots are so much more numerous."

In B. K. Bliss & Son's seed catalogue, published two years previous, in 1872, the following eulogistic description is given: "The golden-rayed queen of lilies is the most beautiful of the lily family. It is perfectly hardy, and for the adornment of the flower garden, the conservatory or the sitting room, it is unrivalled. The whole English floral world, on its introduction, was jubilant with delight, hailing its advent as an astronomer would the discovery of a star of the first magnitude; and in every city, both in Europe and America, it has received ovations such as would have been dear to the heart of the most ambitious prima donna or the most successful conquering hero.

"Specimens were exhibited the last summer in England 6 to 8 ft. in height, with upwards of 100 flowers.

"We have a fine stock of this gorgeous lily in splendid condition, some of which have been grown in our own ground for the past two years, and are of extra size, having produced from fifteen to twenty-five blossoms the past summer, with no more care than the ordinary garden lily. It is perfectly hardy, having stood out the past winter in Massachusetts with a slight covering of straw."

Lilium auratum was first introduced about 1862, so that it was comparatively new at the time the above was written; for all that, the method of treatment advocated is good for the present day. Pot the bulbs in early spring, not burying them too deeply and using light porous soil, such as a mixture of loam, sand and peat, placing them in gentle heat until they have made both root and top. Plant them out in the open ground as soon as all danger from frost is past, setting the plants about 6 in. deep. Good drainage is very essential; failure is almost sure to follow planting the newly imported bulbs in heavy, wet soil. In every case, where the dormant bulb is planted directly in the open ground, it is a good plan to surround the bulb with good clean sand; this will prevent decay and fungoid diseases from reaching the bulb from the surounding soil.

FERN PROPAGATING.

In dealing with strong plants of ferns, they should first be potted in some good light compost, keeping the crowns well down into the soil. As soon as they have made a few roots round the pots they may be turned out, and any crowns that extend a little from the centre can be separated; the rhizome may be cut through and the crown which should have some fronds pulled away (not cut through the roots), by pulling them out some good roots may be secured. With care they will soon start away again after they have been potted, and the old plant, if potted up and taken care of, will give more crowns (or short rhizomes) a little later on. A good stock may be worked up in a comparatively short time. The chief points are to have the potting compost in good condition, and, above all, take care that it is not cold when used. Pot the plants and put them in a close place before the fronds get withered; give very little water until they are re-established. So many get the idea that water is the greatest essential in fern growing, but they are not aquatics, and few subjects resent over-watering more than ferns do. I do not, of course, recommend going to the other extreme.

Pteris serrulata major cristata, that which was known as the "Chiswick variety," although what appeared to be fertile fronds were produced freely, the spores invariably failed to germinate, yet I always found it was worth propagating in the manner described above. It is remarkable that while most of the heavily crested ferns come freely from spores, the varieties with the feathery or more leafy fronds fail to produce spores. Polypodium Schneideri and Polypodium Mayii, beautiful ferns, have both failed to produce spores, but having more spreading rhizomes, they are not difficult to propagate. I find these are best handled before they get too vigorous, and by taking off the short points, just far enough back to get a few good roots, and nursing up the old plants a lot of smaller rhizomes may soon be had, and these, with the smaller fronds, make good stock.

Lomaria discolor tripinnatifida is another beautiful plumose fern, which when it gets to a fair size may produce some side shoots on the stem. By binding a little sphagnum moss and peat round, some good roots can be secured before taking them off. It is rarely that fertile fronds are produced, but I have had them and raised seedlings, and though some have come true, many have reverted to the ordinary discolor.

In regard to the best time for propagating ferns, more will depend upon the condition of the plants than any particular season. To try to do anything in the way of dividing up a plant while it is in a sickly condition, is to court failure. Get some nice young roots round the pots before attempting dividing them. I find that, with good convenience one time of the year is as good as another, except for those that require a period of rest, and with these the best time to handle them is early in the

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ROYAL
Agricultural and Horticultural Society.
ANNUAL AUTUMN EXHIBITION, MARCH 2, 3, 4.
THURSDAY—Stud Cattle, Draught and Roadster Stock, Horses in Action. Concert at 8 p m in Main Building. FRIDAY—Horses in Action, Flowers, Vegetables, &c., &c. SATURDAY—Horses in Action.
ADMISSION—Ground, 1/; Reserve, 1/; extra Gates open at 1 p.m. each day.
JOHN CRESWELL, Secretary

year, or soon after they start into active growth. They may again be divided, but not too late in the season, as they should have time to get re-established before the period of rest in the autumn. A great point in dividing up ferns is not to use the knife too freely. I like to shake away the soil and pull the plants apart after the rhizome has been cut through. A knife may be used to cut away any dead roots, but if the balls are cut through, all the best points of the young roots will be lost.

A. Hemsley.

CARNATIONS.

HOW TO GET CUTTINGS AND GROW THEM.

The question is always before us, which are the best to take, the top or the base cuttings? You will generally find these classes of cuttings on the plants, but once in a while there will be a variety that will only give base cuttings, and, then, again, a variety that you will have to keep all the buds broken off in order to get very many cuttings. The base cuttings, or top cuttings, as they are sometimes termed, will make just as good a plant as any cutting that can be taken, provided they are not allowed to advance too far in growth. They should be at least 4 in. long. The cuttings that come on the stems, just above the point where you cut the stem when removing the bloom, are as good as the base cuttings. Then, again, there is a cutting that comes on the stem about 6 in. below the bud. This I consider of no value, for it will give short stems and weak growth; and by taking this class of cuttings, year after year, it will ruin the variety, no matter how strong the stock was at the start. The same remark holds good with other classes of cuttings. If you persist in taking cuttings of weak growth or too short in growth, this will, likewise, ruin the variety. It is better to leave them on a few weeks, so they will grow into strong cuttings.

When taking cuttings pull them sidewise, carefully, so that they will part from the step at the axil. At teh same time do not grasp the cutting hard, as nothing will start it to rot so readily as a bruise. This manner of pulling cuttings is for those that come on the stem. The top cuttings should be cut between the joints, leaving enough joints for them to break again. Do not allow the cuttings to lie around very long at a time. Use a box or a basket, lined with a piece of burlap. This should be made wet. Have a can of water with you, and as soon as you have a few cuttings pulled, wet them, repeating this every once in a while. After a nice lot of cuttings has been picked, either prepare them for the sand at once or put them in a cool cellar in a temperature of 48 to 50 degrees, and free from draught. Go over the cuttings and the base, or end to be inserted in the sand, should be cut off, so as to have a clean cut. A knife with a poor edge will make a ragged cut, and the cutting will take longer to root, and, in some cases, will not root at all. Remove all the foliage from this end of the cutting, so as to leave about three-fourths of an inch to insert in the sand, and if the cuttings are very large, or the grass is long, clip them slightly.

Make sure to have good clean sand, and pack it firmly, and in about one hour before ready to stick in the cuttings, wet the sand thoroughly. Place the cuttings in the rows far enough apart so that the sand can be seen, or 2 in. one way, and just so that you can put your fingers between the cuttings the other way. Be sure to put them in firmly; and after a whole row has been inserted press the sand against them so they will stand up when being watered. After ten or twelve rows have been planted, water them, skipping none. Give enough water so that it will run over the sand. This will close the sand around the cuttings and keep away the air. Syringe on bright days two or three times, and if the weather should turn warm during the first two weeks, syringe five or six times, and on cloudy days, once, unless there is a heavy wind, when they will need syringing twice. The best way to do syringing is to get a spray for the hose that will throw the water over the cuttings in a mist.

Chas. Knopf.

L. H. HOWELL,
MT. VICTORIA, N.S.W.,
has imported per steamship Fifeshire
TEN CWT.
GLADIOLI,
embracing
200 Finest European Varieties,
for
Autumn Flowering.

HYBRIDISING.

Inasmuch as the sexuality of plants was unknown, or at least very imperfectly understood, prior to the last two centuries, while a knowledge of the sex distinction of animals dates from the dawn of human history, it is not surprising that while the hybridising of animals was well understood by the ancients they did not know that crossing was possible with plants. Experimental proof of the sexuality of plants was published for the first time by Camerarius, December 28, 1691, and only after this discovery was the function of pollen and its necessity for seed formation understood. About twenty years later Thomas Fairchild, an English gardener, made the first recognised plant hybrid by crossing the carnation with the sweet william. The plants grown from the hybridised seeds, known as Fairchild's sweet william, were cultivated at least a hundred years under the same name, and possibly are still in cultivation. The first careful studies of hybrid plants were made by Koelreuter in 1760, and not till nearly the middle of this century was his work surpassed.

That unusual vigor of the offspring results from crossing slightly diverse plants has been thoroughly proved by the striking researches of Darwin and others. It has been said by Naegeli that "the consequences of fertilization reach their optimum when a certain mean difference in the origin of the sexual cells is attained," and by Fritz Mueller that 'every plant requires, for the production of the strongest possible and most prolific progeny, a certain amount of difference between male and female elements which unite. Fertility is diminished as well when this degree is too low (in relatives too closely related) as when it is too high (in those too little related)." Darwin says: "The offspring from the union of distinct individuals, especially if their progenitors have been subjected to very different conditions, have an immense advantage in height, weight, constitutional vigor, and fertility over the self-fertilised offspring from one of the same parents."

Attention has been called by Willis to three factors in the gain resulting from cross-fertilization, viz: (a) fertility of mother plant; (b) vigor of offspring; and (c) fertility of offspring. The relative value of these factors varies with different plants. In the carnation, for instance, factor (a) of cross-fertilised plants was 9 per cent. greater than in self-fertilised plants, (b) was 16 per cent. greater, and (c) was 54 per cent. greater. Even when the fertility of the mother plant is greatly reduced by hybridising with a distinct species and the hybrids themselves are sterile or very infertile they nevertheless often show extraordinary vigor, that is (b) is often greater in hybrids than in pure-bred plants, but factors (a) and (c) are usually less. In plant breeding the importance of this increased vigor is very great.

When a hybrid possessing desirable characters is produced from plants propagated by seed it is almost invariably necessary to render these characters hereditary by careful selection and in-and-in-breeding. Darwin says:

"Florists may learn . . . that they have the power of fixing each fleeting variety of color if they will fertilise the flowers of the desired kind with their own pollen for half a dozen generations and grow the seedlings under the same conditions. But a cross with any other individual of the same variety must be carefully prevented, as each has its own peculiar constitution. After a dozen generations of self-fertilization it is probable that the new variety would remain constant even if grown under somewhat different conditions."

When a desirable hybrid is produced, it should be fertilised with its own pollen, the seeds thus produced planted, and the seedlings selected which most perfectly show the characters which it is desired to fix, after which these selected seedlings should be inbred and a third selection made, and so on, until the desired characters are produced true in all the seedlings. In case a desirable hybrid is found to be sterile to its own pollen, it should be fertilised if possible with pollen taken from similar hybrids showing the same variation.

In the continual self-fertilization practised in fixing variations there is doubtless much loss of vigor. In some cases this might be avoided by making numerous hybrids between several different sets of individuals of the same sort, but not closely related (that is, separated by numerous seed generations), so that several unrelated hybrids, showing practically the same combination of characters, could be obtained. These hybrids could be bred together and rigidly selected each generation, until all the seedlings produced show the desired combination of characters. However, in order to avoid the greater possibility of losing the variation, it is probably best in all cases to self-fertilise, if possible, a portion of the flowers.

There is evidence which shows that odorless plants have been rendered fragrant by hybridising with scented species or varieties. According to Wittrock, pansies have been considerably improved in this respect by crossing various sorts with the fragrant V. Cornuta. Violetta, a fragrant sort, was produced by crossing V. cornuta with pollen of the pansy Blue King. Sensation; another scented variety, was also produced by crossing V. cornuta and the pansy. Wittrock, who is probably the best authority on violets and pansies, says: "No pains have been spared of late by the pansy cultivators of Great Britain to increase the charm of the pansy by obtaining perfume as well as beauty, but by a more extensive use of the odoriferous alpine species (V. cornuta L. and V. lutea Huds., var. grandiflora (L.) Vill.) for hybridization doubtless much may still be done in this direction."

PROVED SORTS OF TUFTED PANSIES.

So many lengthy lists of Tufted Pansies are issued that the inexperienced grower becomes bewildered when endeavoring to compile a list of the best. Each season sees additions to the already long list of sorts, and, that intending growers may be helped in making a good all-round selection, the present opportunity is taken to give their names and descriptions. This should enable the would-be grower to determine those sorts best suited to his requirements. For the next two months propagation by cuttings will be largely practised. The more noteworthy varieties are given prominence under the heading of their respective colors:

White.

White Empress.—This variety is also distributed under the name of Blanche, and as a good robust and free-flowering creamy-white sort it is superb. The blossoms are large and rayless, and possess plenty of substance. It is also a most continuous bloomer.

Seagull.—A very beautiful pure white, rayless flower, with an extremely neat yellow eye. The plant has a very good dwarf and compact habit, and is free flowering.

Elaine.—This is a large pure white flower, with a suffusion of yellow on the lower petal. The blooms possess plenty of substance, and are developed on a splendid length of footstalk. It is free flowering, and the plant has a capital constitution.

Edward Mason.—This variety does well in the warmest weather. The flowers are pure white with a neat yellow eye, and rayless. The plant is a very free bloomer, and possesses a beautiful habit of growth.

Cream King.—A novelty of the present season, in which the rayless blooms are very large and circular, and of splendid substance. The color may be described as a rich creamy-white, with a brilliant orange eye. Extra strong growths are benefited by having their points pinched out occasionally.

Pencaitland.—This has had a good trial, and is now recognised as a very useful kind. It is a pure white sort, and is slightly rayed.

Yellow.

Kitty Hay.—In this the color is a particularly striking shade of yellow, and is most effective when the plants are grouped in quantity. The flowers are rayless, and the plant is a profuse bloomer.

Melampus.—In this plant we have a kind with a perfect habit, and this, together with an erect flower-stalk, carrying the blossom well above the procumbent foliage, makes it a distinct acquisition. The flowers are of goodly proportions and rayless, color deep yellow.

Andromeda.—This is a 1900 novelty, of which but little is known. The flowers are very large, and the color may be described as bright yellow, with a deeper shade of yellow on the lower petal. With age the blossoms pale off to a primrose on the edge of the upper petals. The plant has a good tufted habit.

Bland G. Sinclair.—Although only distributed in 1901, this variety, a free-flowering bright yellow self, has achieved distinction. The plant has a creeping-like style of growth.

Klondyke.—The modern florist would probably find fault with this flower, yet the free manner in which the blossoms are developed appeals to all who have seen them. When massed the effect is very striking. Color, clear yellow, rayless.

Pensee d'Or.—Unfortunately, there is very little stock of this lovely variety obtainable. The habit is all that could be desired, and the plant is a profuse bloomer. The deep rich orange-yellow color of the flowers is one of its chief charms.

Blue.

Pigmy.—This is not a large flower; in fact, it is one of the miniature sorts. The plant, however, is very free-flowering and has a good habit. For edgings this plant has a special value. The color may be described as deep heliotrope-blue, and the flower has a neat yellow eye.

King of the Blues.—This excellent kind is one of the late Dr. Stuart's raising, and is the best true blue sort. The flowers are of small to medium size, and the beautiful deep blue color is enhanced by the bright yellow eye. The blooms are rayless, but are heavily veined in the centre. Habit good, and also a free-flowering kind.

Blue Gown.—If good pieces of this delightful Tufted Pansy can be secured, there is no better. The habit is ideal, and the plant flowers freely. The color may be described as mauve-blue. Rayless.

Other Colors.

Florizel.—No collection can be considered complete without this variety. The smallest pieces will develop into handsome plants which will bloom freely. The color is a shade of blush-lilac and the blooms are rayless. Habit perfect.

Virginus is a refined and beautiful flower of a pleasing pale blush color and rayless. The habit is dwarf and compact and the plant blooms freely.

Councillor W. Waters.—This has a good habit and is free-flowering. The color is rosy-purple.

Magie.—This variety is often printed as "Maggie," but the name given in this instance is the correct one. It is a large, deep rose flower, paling somewhat in the warmer weather, and it has a neat yellow eye. Habit compact and fairly dwarf.

Duchess of Fife.—This is generally considered one of the very best of the margined flowers, the color in this instance being primrose, irregularly margined blue. The habit of this plant is dwarf and crawling, and each plant develops into a large clump. Two other members of this same family are Goldfinch and White Duchess, and these are slight variations from the variety under notice.

Crown Jewel.—This is somewhat similar in its markings to Countess of Kintore, so well known. In this case, however, the colors are brighter and the habit is far better.

D. B. Crane.

DESIGN FOR TABLE DECORATION.

A charming effect may be produced by dispensing with a tablecloth and leaving a well-polished top bare. This is especially suitable for a black oak or dark walnut table. At each cover there must be a dainty d'oyley for the plate to rest on, and a smaller one on the left side for bread. In the centre, running lengthwise, an arch of flexible wire holding small glasses for cut flowers, at each corner a miniature arch. Surrounding the centre arch should be four silver candlesticks; if antique, so much the better. Large and small silver dishes for fruit and bonbons relieve the bareness. Suitable floral decorations would be pale pink sweet peas and the old-fashioned delicate flower known as London Pride. If sufficient silver is not at hand, trails of Virginia creeper relieve the bareness.

ROSES.

TWO NEW ROSES. RICHMOND AND ROSALIND ORR ENGLISH.

We present herewith illustrations of the E. G. Hill Company's new roses, Richmond and Rosalind Orr English. The following particulars concerning the new-comers have been kindly supplied by the originators:

"Richmond is doing elegantly, growing and blooming as well as heart could wish. It is a seedling from Liberty and Lady Battersea, its most remarkable virtue being its freedom of bloom, combined with a fine long stem, a pure scarlet crimson color that does not "blue" when cut, and of a texture that makes it very lasting. It has never shown the least tendency to go dormant in midwinter, but is as responsive to treatment as Bride or Bridesmaid, and is quite as easy to root, and grafts as readily. It is a delightful sensation to step into the house and meet a profusion of bloom and the fragrance of a June morning. One of the variety's strong 'commercial' points is its shipping quality, as it can be cut very tight, like American Beauty, and will open on arrival.

NEW ROSE, ROSALIND ORR ENGLISH.

"Rosalind Orr English was the prize winner at the Indianapolis Show last year, and the donor of the premium was allowed the privilege of naming it. It is being overshadowed by Richmond, but is none the less a ramarkable and valuable rose. The color is much like that of a bright Mrs. Lawson carnation; what might be described as a scarlet pink. It is exquisite in form, very double, and has a nice way of throwing up canes of good length and stiffness; but plants must be well established to do this. It is a fine keeper, and even in the full-blown state, when it reflexes its petals, it is a most effective rose in any decoration. It is a seedling from Mme. Abel Chatenay."

ROSE FRAU KARL DRUSCHKI (H.P.)

The marvellous results obtained by cross-fertilization become more manifest each succeeding year. Herr Lambert, of Trier, Germany, is to be congratulated upon the production of this splendid Rose. It must prove of great value both as a cut flower and for garden decoration. It is magnificent in form in the half-expanded state, but is not excessively double, for in this case the full-blown blossoms open out like a huge semi-double Pæony. It is the snowy purity of the blossoms that gives the Rose its chief value. Hitherto we had no large-flowered Hybrid Perpetual so pure in color. It is really remarkable that the variety is such a dazzling white, for one would expect a seedling from Merveille de Lyon and Caroline Testout to have a shading of blush or pink. The only color perceptible is on the outer petals of the buds, which are tinted rosy-pink, but when the high-centred half-open flower is developed it is of the purest white. It is a splendid grower, maiden plants making shoots each 4 ft. or 5 ft. long, and it appears to be thoroughly perpetual, as every shoot shows a bud. Frau Karl Druschki will be a grand pot Rose, and the fine long stems which are produced will add further to its usefulness. There are few Roses but possess some defect, and it is only right to mention the fact of an utter want of fragrance in this Rose. I prefer fragrance in a Rose to any other quality, but I cannot shut my eyes to the usefulness and beauty of some of those that are deficient of this attribute.—ROSA.

HYBRID PERPETUAL ROSE FRAU KARL DRUSCHKI.

This is probably the finest white Rose in cultivation. The growth of the plant is strong and sturdy, flowering at every shoot; and after the first flush is over it immediately makes a second growth, which in turn flowers abundantly, and with fine weather in late autumn even a third crop of blooms may be anticipated. The Rose is pure white, but in the very young bud state a slight splash of blush is noticed on the outside petals. This entirely disappears as the flower expands, and when in the three-quarter expanded form (the most perfect phase of its possible beauty) no Rose is so white or more exquisitely shaped. The petals are of great substance, consequently of good lasting power, ever growing larger and more rounded as the flower develops. The plant requires a little attention in the way of disbudding, as it is prone to flower almost too abundantly. The clusters of buds should be thinned in order that individual flowers may have sufficient room to open and develop without injuring each other.

This variety received an award of merit from the floral committee of the Royal Horticultural Society, London, when exhibited by Benjamin R. Cant & Sons, the Old Rose Gardens, Colchester.

ROSE JEANNIE DICKSON (H.P.)

The old and formerly popular Victor Verdier must submit to being ousted from our collection in favor of the above-named Rose. It is a splendid bold flower, huge petals, and of a most pleasing color, rosy-pink with silvery shading. The petals, being so stout, can withstand rain to a greater degree than many Roses, and on this account it is useful. It is of a much better habit of growth than Victor Verdier, and it makes an excellent companion to vigorous H.P. Roses of the type of Mrs. John Laing, Ulrich Brunner, &c. I hope raisers will not go on sending us scentless Roses, for, however splendid they are, they do not fully satisfy. Unfortunately, Jeannie Dickson must be classed among the fragrantless Roses. It strikes freely from cuttings, and even little yearling plants produce massive flowers. It is splendid for pot culture.—Rosa.

A GOOD AUTUMN BLOOMING ROSE.

Roses that blossom well in autumn are valuable, and, as an autumn bloomer, Heinrich Schultheis holds a foremost position. In a border I have standards of this kind, and at the end of September I counted from sixty to seventy blooms open or to open on one plant. The flowers open well, not being so full as those of some other kinds. It is a good grower with me, having clean glossy foliage and strong shoots, on which are often bunches of from three to seven blooms. Another recommendation is that it is not liable to mildew. My custom is to go over the plants in August, syringing with an insecticide, this preventing mildew attacking the foliage. This Rose has a lovely scent; I have a few blooms on my table as I am penning these lines, and the perfume is delicious. I often think too little attention is given to kinds that have this charm.—J. Crook.

NEW RED ROSE RICHMOND.

ROSE BEN CANT.

This splendid Rose will undoubtedly take a foremost position among Show Roses. I am told it is a cross between Suzanne Marie Rodocanachi and Victor Hugo, and one need not be informed of its relationship to the former, as it is so patent from the splendid shell-like petals. The variety inherits the glowing color and pointed, high-centred form of Victor Hugo, but is apparently a stronger grower than either of the parents. This Rose has been awarded the highest honors obtainable—namely, the gold medal of the National Rose Society and an award of merit from the Royal Horticultural Society.—C. W.

VERY DARK ROSES.

One is frequently asked to recommend a good dark Rose that is satisfactory in growth and bloom. Undoubtedly Prince Camille de Rohan is the best very dark Rose we at present possess, and truly splendid it is when well developed. It requires high cultivation in order to bring out its good color, for when neglected or in poor soil the flowers are quite a light red hue. Although standards or half-standards seem to yield the best blossoms, I have had lovely flowers from the seedling Brier. It roots freely from cuttings, but the flowers seem to require powerful root action to bring them to perfection. La Rosiere is bracketed with Prince Camille de Rohan as being too much alike. This they are when in blossom, but I find the former the freest bloomer on young plants, which indicates that the two kinds are not exactly synonymous. A cool season suits the dark Roses best, the beautiful velvety shading being very lustrous. It is an excellent plan to dig in a liberal dressing of good farmyard dung about the end of November, and at the end of May, when buds are swelling, give a good watering once a week of liquid manure, if possible from the cow-yard, and it may be given of good strength if the plants are well established. Abel Carriere is another good dark Rose, which is best from standards or half-standards. The form is imbricated, and, from an exhibitor's standpoint, less meritorious than the last-named. At times, however, the rich maroon color is very intense, the half-expanded flowers being superb. Both kinds should be in every fair-sized collection, and if a third is wanted I should name Baron de Bonstettin. In all three cases vigorous growth is required, and a severe clearing away each year of the old wood, the one-year-old being retained a good length.—E.

PREPARING BEDS FOR DWARF ROSES.

Unless your soil is badly drained, it will not be necessary to raise the beds for the Tea or Hybrid Tea Roses, but you must take care that the drainage is ample when preparing. This you can do by well breaking up the subsoil with a fork. Some broken bricks, large stones, or crocks to a depth of 6 in. placed about 2 ft. to 3 ft. below the surface would provide sufficient drainage, but this would only be necessary if the garden lies low and water passes away slowly. The Hybrid Teas generally should be regarded as Teas. They, like the latter, prefer a somewhat porous soil, therefore a fair amount of grit should be well incorporated with the staple soil. You must, however, plant firmly, and see that the roots are not cramped, carefully place them in the hole, and work in some fine soil among them before treading. As you desire to plant rather thickly, you may place the majority of varieties now grown 1 ft. 6 in. apart. Kinds marked "moderate" in catalogues may be planted 1 ft. apart, and those marked "very vigorous" should be 2 ft. apart. By planting thus, you are enabled to prune away much of the old wood each season, and the quality of blossom obtained from the previous season's wood is of the best description. The dwarf-growing Polyantha Roses should be planted from 12 in. to 15 in. apart. If you desire to keep them very dwarf, you may prune close to the ground each year, otherwise treat them as Tea Roses.

ROSE GARDENIA.

I have been agreeably disappointed with this Rose, which proves that a hasty judgment of Rambler Roses is to be deprecated. I imagine it will be possible to raise a fine variety from it in course of time. Even now the flowers of Gardenia are some 3 in. in diameter, of a beautiful pale yellow color, expanding to sulphur-white as in Solfaterre. The buds are charming, produced singly in most cases, but not infrequently in twos and threes, and of the tint of Perle des Jardins. When gathered they are scarcely distinguishable from Tea Rose buds. The only detraction from these valuable running Roses is their want of a perpetual flowering character, so that, of course, they are not comparable to the Teas and Noisettes, but there is this to be said of them—they appear to be exempt from mildew, and spring frosts do not harm them; at least, that is my experience of the Rose under notice, and also of Jersey Beauty. I would particularly recommend Gardenia as a pillar Rose and for the supports of a lofty pergola where it will receive plenty of sun. This and Jersey Beauty are much too good to be planted where perhaps they will not receive that attention which their merits entitle them to. If a position could be prepared after the style of that at Kew, then I would say plant these two freely. In this dell garden many loads of really good soil were placed before a Rose was planted, which explains why the Crimson Rambler and other glorious kinds are in such a flourishing condition.—Rosa.

THE DAHLIA.

No other garden flower has been more improved upon of late years than the Dahlia. From the old stiff forms and dull colors have been evolved ever new and graceful varieties and dainty tints.

Introduced over one hundred years ago, a Dahlia speedily became a favorite. The form then was almost a perfect ball, and the more spherical and artificial it was, the higher it was prized. Gradually, however, it lost favor and was looked on as a coarse, stiff flower of little value and seldom cultivated. Since the new Cactus Dahlia came this has all been changed. The old stiff forms have given way to loose, fantastic shapes. New irregular and æsthetic varieties now originated and being introduced have redeemed the Dahlia and made it the most popular garden flower grown. Hundreds of Dahlia Societies have been formed in England and in the Eastern States; also in Germany. The name Cactus Dahlia, which was given them because of their fancied resemblance to the flowers of the Cactus, has been replaced by the title of Edel, or Noble Dahlia. Every conceivable color and shade of color, from pure white to almost black, is now represented, and besides its gorgeous tints and splendid colors the chrysanthemum appears dull and faded. The best of the new varieties are Segfried and Lord Roberts, white; Mrs. J. J. Crowe and Mrs. Saunders, yellow; Uncle Tom and J. H. Jackson, dark maroon, almost black; Standard Bearer and Star Fish, bright scarlet; J. W. Wilkinson and Flamingo, intense crimson; Rosine and Lord Brassey, pink; Countess of Lonsdale and Clara G. Stredwick, salmon shaded to yellow; Britannia, shrimp pink; Ruby, intense ruby, red tipped magenta; Alpha, white spotted and splashed with purple and red; Innovation, scarlet tipped, pure white. The noble and fantastic shapes of the beautiful blossoms attract and charm the spectator; and many, very many, who hitherto only despised the Dahlia, have now become converted to the Cactus. For San Francisco and vicinity they are among the very best bedding plants. The cool weather just suits their requirements, and the fog—so fatal to many other flowers—never hurts the bloom of the Dahlia. Planted in March, they will bloom profusely and continuously from June till November. Any kind of soil suits them provided it is moist and rich. Plant the roots about six inches deep. When the shoots appear, break off all but one. When this has grown four or five inches high pinch out the top or end—it will soon branch out—after which, fill in around the plant with well-rotted manure. Treated in this way they will grow strong and sturdy and resist high winds. In conclusion, I would advise to disbud freely, pinching out all the buds except one on each stem. The improvement in size and beauty of the blossom more than repays the extra trouble. For exhibition flowers disbudding is indispensable.

FEEDING DAHLIAS.

In the matter of feeding dahlias the weather makes much difference, for in wet, cold weather very little can be done, whereas, if a hot, dry time sets in the grower is kept busy. In these days of high culture feeding has become almost as necessary in dahlia growing as it is with chrysanthemums. As soon as the plants are producing buds on their first strong main stems, and before they have felt the strain of blooming, is the time to commence to feed, this is, of course, providing they are in such a state as to require water. I always start with a stimulant made from natural manures, and find that on light soil nothing equals cow manure, although almost any manure with ammonia in it is very suitable. After one or two waterings with this, if the plants are still able to take more, so far as moisture is concerned, give them stronger doses and extend the watering farther from the main stem, not forgetting to water well underneath the plant, as the foliage sheds the rain, so that the soil near the stem remains perfectly dry.

As the first large flowers will now be opening, dahlias will need a good deal of feeding to satisfy them; it is, indeed, surprising what a healthy dahlia plant will consume in the way of manures, and it is probably this very fact that leads many amateurs with but few plants to pour an excessive amount of liquid manure round, with the result that over-large buds are formed, and when these open the flowers are found to be deformed, and divided into several centres. This extreme, however, need not be approached. Every time the dahlias need water, possibly two or even three times a week, some sort of manure should be given in it, and after the first waterings with natural manures, artificials may be used. Two gallons of water is a very fair amount to give each plant if at all dry, mere surface sprinklings being useless. Vary the diet, and when the flowers seem to need a little extra stimulant give a dose of sulphate of ammonia. This latter, however, needs care, as it is very strong, though an excellent manure for filling out flowers and stimulating the plant.

It is certainly much easier to feed dahlias in comparatively dry weather than in wet, but should it be wet, the plants may still need feeding in some degree, and the only way to do it is to sprinkle the dry manure on the surface of the soil and let it wash in with the rain. Horse manure spread all over the ground is as good as anything in a wet season, as the goodness can filter down to the roots. On the other hand, the plants will grow so much more foliage, and be enabled to get so much out of the soil in wet weather, that it is not necessary to feed to anything like the extent that is needed in summers like we have had for several years past. One thing is worthy of note, and that is not to delay feeding dahlias till a few days before fine flowers are wanted, and then begin to try to rush out fine, deep blooms. The feeding must commence early, i.e., when the buds are forming; heavy feeding when a flowers is ready to open may have the effect of pushing out a larger flower by lengthening the petals, but if the bud has not the required number of florets in it, a poor flower will result.

In making these few remarks, I may mention that the strength of the stimulants used must be governed by the grossness of the plants, and the habits of the individual varieties, but in these matters the judgment of the growers must be brought into play.

J. H. S.

The Orchard.

OPERATIONS FOR FEBRUARY.

Operations for this month will keep the orchardist busy in body and mind. His body will have good exercise in keeping the cultivator going amongst the portions of the ground where the trees are young. Irrigation is out of the question in most places, and the cultivator must be kept going to help the dry ground to retain what moisture it can underneath. His mind will be much exercised upon the return he will get from his fruit as the result of his year's labor. Marketing is where a large number of fruitgrowers fail. They know how to get the fruit, but how to dispose of it is a phase of the business where they lack training. This is difficult to understand, and some day gardeners will perhaps rise to the fact that the business part of an orchard is very essential to profit and shou'd be learned early. In the first place every fruit should ke handled with the same care as eggs. There is a lot to learn in that, especially with the softer fruits. Sellers should know that fruit handled like coal will not find buyers. The second lesson is in grading and packing. The details of making fruit ready for market seem to take a lot of time, but there is more money in it than will pay for the extra care bestowed upon it. Then the storing. It is just as necessary to store fruit carefully as it is to handle it carefully. A wise man will only need the hint to keep in his store what he cannot sell in the market.

Now regarding the summer treatment of trees Mr. Luffman has some very instructive rmarks to make in the "Victorian Journal," and we quote hem at length,

Fruit trees of all kinds yield the best average crops where their branches are thinned, stopped, or otherwise dealt with from year to year. Any cutting done whilst the head is leafless or making no visible movement tends to strengthen the tree, by reason of the same amount of root action as formerly expending its energy on a smaller number of branches. Further, new buds are possessed of greater energy than old ones, hence where sap forces their development clean and direct channels are made for the passage of sap.

The amount of sap circulating in spring and summer, its character and distribution, as seen by the even or uneven growth of leaves and new wood, determines how far a tree may be thinned and stopped.

In every orchard of size, trees of various form, age, and condition exist, and no uniform way of pruning at any season may be adopted. Nor should pruning be carried out during one particular month, but always according to the year and the individual capacity and demands of each tree. Irrespective of species or variety, where branches are far apart, little or no thinning of the leaves and young wood is necessary in summer, as over exposure tends to burn both foliage and bark, devitalise the sap, dwarf and injure the quality of the fruit, and shorten the profitable life of the tree. Summer pruning is therefore most beneficial when carried out on strong trees, which have their main and secondary branches excessively crowded, and which provide insufficient light and air in motion to secure proper leaf development, and ripening of the leaf-yielding wood.

Wherever trees of any kind are old and hard of bark, growing in exposed and hungry soils, or stagnant from any other cause, their leaves should not be reduced in number during the summer season. Summer pruning is helpful and most necessary to the young and the strong, since in the strong it takes away such surplus growth as would interfere with the desired form, and encourages growth to fill up parts which might otherwise remain bare and profitless.

It is possible to prune trees in winter only, and secure an even distribution of foliage and fruit, but it is invariably much more economical and sure to prune at both seasons, since the tree can be kept under control more by frequent than infrequent handling. Further, summer pruning prevents labor of hand, and waste of energy on the part of the tree, whilst winter work invariably increases labor of hand, and adds to the unfruitfulness of the tree, that is, if not supported by summer work.

Summer work on trees may be carried out from the time leaves push out until they show signs of maturity in early autumn.

Between these periods all the new wood of the year will be made. Fruit is borne on new or comparatively new wood only, and the size, chemical nature and general health of the leaf determines the nature of the bud it will furnish. To keep trees growing new leaves must be constantly unfolding, as wood does not extend after a leaf reaches maturity, so that where we desire to extend the size and vigor of young trees, they should not, as they would, be checked by summer pruning. Only in early spring and summer is it necessary to deal with young trees—rubbing off any buds which unfold in bad positions, as on the stem, or below where the main branshes are desired, and a little later taking out the point of any extra stray shoot, so as to ensure an equal growth to its neighbors.

To persistently pinch and stop young trees in summer shows complete ignorance of their wants, and must ever prove a misfortune to their owners.

The more leaves a plant can make and maintain the more it will grow, and growth is all that is desired of the young and undeveloped tree. In a general way trees require hard winter pruning, and a little spring and early summer work in the way of thinning and stopping up to their third year. After this, if decidedly strong, they will require less cutting in winter, and this chiefly in the direction of spacing the branches to provide for the lighter fruit yielding wood, and in spring and early summer such thinning as will provide space and full development of the requisite light wood. On the other hand where a tree is weak, little or no spring or summer work is done, since every leaf is wanted to help on the circulation of the sap, without which the tree cannot survive long.

As trees come near to the bearing size they demand more careful and frequent treatment in summer. An even crop of well formed, perfectly healthy, and well ripened leaves is required of all trees before they can yield even and good quality crops of fruit.

To get the best average results summer pruning should be practised at three periods. In spring and early summer to sweep away any excessive buds or shoots, which would, if allowed to stand, choke the desired leaves and the buds expected of them. Later on—in December and January—according to season, region, and vigor of trees, more thinning will be beneficial, and also the stopping of stray shoots, or in the case of the apple converting shoots into spurs, since this check during the hottest period of the year invariably suspends the circulation of the sap, changes it chemically, puts additional pressure on the light wood which has been left, and thereby forces a weak new growth, which more ripe in nature than the earlier growth, forms flower buds where dormant or active wood buds would otherwise appear.

Where spurs are made, a leaf or two must always remain at their ends, otherwise they will die through the sap having no power of rising to a leafless and budless point.

Towards autumn, normally in March and April, healthy bearing trees make more growth, which, if allowed to stand, overwhelms the leaves and buds made earlier in the year.

Late summer growth should therefore be removed outright from all mature trees, for it works injury in many ways. In the first place the main crop of leaves must have room to ripen themselves and the wood whence they spring. Next, the late growth if allowed to stand adulterates and weakens the sap, so that flower buds are less liable to come perfect and develop fruit, and further, the action of the root is disturbed to the extent that it has less power of supplying the class of sap to which fruit looks for sustenance and support.

Many points in connection with summer pruning are not stated here, but enough has been said to indicate the principles involved, and to afford an approximate guide to those who have any natural capacity for doing the work.

Vegetable Garden.

OPERATIONS FOR FEBRUARY.

Unless water is plentiful it is a very difficult matter to keep up a vegetable supply at this season. Frequent hoeing will save a deal of watering, and keep plants growing till rain comes.

As soon as crops of peas, etc., are gathered, the ground should be deeply worked and manured for the reception of other crops.

Cabbage and cauliflower plants may be set out, giving sufficient water to "settle" the soil round the young plants. "Early Eclipse" is the cauliflower grown by most of the market gardeners. "Late Eclipse" is the latest planted, and some growers have an intermediate variety, a cross between the early and late.

Where the caterpillar of the cabbage moth is troublesome the plants should be sprayed with Paris green 1 oz, new lime 1 lb., 10 gallons water.

Sowings of cabbage and cauliflower seeds may be made for succession.

Planting may be made of early potatoes for an autumn crop.

A FUNGUS PARASITE ON THE CODLIN MOTH.

[By D. McAlpine.]

Early in October, when carrying out spraying experiments in Mr. A. F. Thiele's orchard, at Doncaster, that grower called my attention to the fact that numerous codlin moth grubs were being killed by a white fungus that enveloped them. He calculated that as many as 90 per cent. were destroyed in this way, and considered the disease to be of the nature of an epidemic. The zinc bands around the tree-trunks were being removed and examined at the time of my visit, and I obtained a number of dead specimens in order to examine the fungus which appeared as a dense, woolly covering around the bodies of the larvae. In some cases the fungus grew out from the body in the form of slender stalks, expanding at the free end, and in one instance three such stalks were observed about 10 millimetre[*] high, and ending in a club with a white mealy covering. On examining this white material under the microscope, it was found to be a mass of fungus filaments, with numerous projecting Penicillium-like bodies, bearing innumerable spores or conidia, as they are technically called, which was the cause of the mealy appearance. The dense, white mould directly covering the grub did not show at this stage any of the reproductive bodies. Several of the grubs were placed in damp chambers, not, however, so moist as to encourage the growth of other fungi, and in about five days there was a profuse development of conidia. The fungus might either be chalky-white or ochraceous, or a mixture of both, but the conidia produced in each case were the same, showing that the fungus varied in its color. At various points, short, thread-like stalks were produced, and it was soon decided that the conidia might either be produced at the tips of these stalks, or directly from the fungus filaments enveloping the body. Here, then, was an undoubted fungus attacking the codlin moth grubs and destroying them at the stage when they were about to pass into the chrysalis form. It was also found to be capable of reproducing itself freely, and thus a means of spreading the fungus was easily obtainable if it should be found practicable to destroy the codlin moth in the grub stage by this means.

PREVIOUS RECORDS OF PARASITIC FUNGI ON THE CODLIN MOTH.

The codlin moth, like others of its class, has many natural enemies, and these have all received more or less attention at the hands of investigators. T. D. A. Cockerell[†] in "Preliminary Notes on the Codlin Moth," has pointed out its natural enemies occurring in New Mexico, and these include:—1, birds; 2, bats and other vertebrate animals; 3, hymenopterous parasites; 4, a beetle larva; and 5, a parasitic fungus. It is with the latter that we are more directly concerned, and considering the importance of the subject, his remarks are quoted in full.

"On November 4th, 1896, two dead codlin moth pupae were found on a tree, both attacked by a fungus. Later on, a worm was found in a mummified condition, its death apparently the result of a fungus growth. Still further search showed that a small percentage of the mature worms, and also of the pupae, perished in this way, but the disease was not prevalent enough to be of much importance.

"In April, 1897, in Mesilla, many worms which were kept in a bottle died from the attack of the same fungus, which had all the appearance of the celebrated chinch-bug fungus, Sporotrichum globuliferum. Specimens were sent to Dr. R. Thaxter for a critical opinion, and he replied that the fungus seemed to him to be Sporotrichum globuliferum."

"This is the first and only definite record that I am aware of as to the occurrence of a parasitic fungus on the codlin moth.

In September, 1899, Mr. Cock, orchard inspector, sent me dead grubs from the Castlemaine district, enveloped in fungus filaments, but since there was no fructification present, the fungus could not be determined.

NATURE OF THE FUNGUS FOUND IN VICTORIA.

The general characters of the fungus have already been given, but a more detailed account will be necessary to settle its systematic position The fungus filaments, which are about 3 microns[*] broad, either directly envelop the body or grow out into compact, interwoven threads, forming a slender stalk often expanded at the free end, and the upper two-thirds has a white, mealy covering composed of innumerable colorless conidia. Directly from the filaments covering the body, or from the threads composing the stalk, there arise the conidia-bearers, which resemble those present in the common blue mould on rotting fruit, &c.—a Penicillium; that is to say, there is a long, slender filament, variously branched, often in whorls, and at the end of each there are flask-shaped basal cells or sterigmata, which bear the conidia in long chains. The conidia are colorless, subglucose, or, shortly oval, very minute—2½ x 1½ microns. The characters are those of the mould known as Isaria, and the form agrees very closely with Isaria farinosa (Dicks.) Fc., or Mealy Isaria.

USE OF THE FUNGUS AS AN INSECTICIDE.

The question is often asked by growers and others, can natural enemies be used to keep down insect pests? Experiments have been carried out to supply an answer to the question. The results of these experiments generally have been to show that only a limited amount of relief can be expected from this source. There is no doubt that the method of pitting nature against itself is a most economical one, and that most satisfactory results might be expected from it, but it would appear that we have not yet learned how to apply these natual remedies to the best advantage. For example, Cockerell found that the Mexican fungus worked great destruction among the grubs in the damp atmosphere of a bottle, which contained some wormy apples; but out in the orchard its effects were inconsiderable, and he adds the remark—"There is no hope that it will ever prove efficacious in our dry climate. Although the fungus dealt with was supposed to be Sporotrichum globuliferum, yet it is sufficiently allied to ours to render the results generally applicable. However, there are also experiments to fall back upon, in which this identical fungus was used, though on other insects. R. H. Pettit[†] connected with the Cornell University Agricultural Station, experimented with the Mealy Isaria on a number of different grubs, and the results were very unsatisfactory.

White grubs, the larvae of Lachnosterna, were dusted with conidia, and after four months no trace of the fungus was visible. Although most of the specimens died, they showed no trace of the fungus. Again, 15 specimens of the larvae of Pieris rapae were dusted with conidia, and in about 20 days the adult insects emerged. However, a certain measure of success attended a third experiment. Seven specimens of the common brown and black caterpillar Pyrrharctia isabella were infected by fastening the conidia with white of egg, by means of a brush. After 20 days, all but two were attacked by the fungus, and "of the five attacked, four were dead, curled up and covered more or less densely with a thick cottony mass of mycelium, most prominent on the ventral side."

The chinch-bug fungus and the locust fungus are now both pretty well known, and the success of their application seems to be so dependent on the weather conditions that the results naturally vary. In the Year Book of the United States Department of Agriculture for 1901, Dr. Howard, Government Entomologist, has an article on "Experimental work with Fungus Diseases of Grasshoppers," and he comes to the conclusion that "the results are definite enough to induce still further investigation, which will be carried on during the summer of 1902, but the results obtained so far do not justify very sanguine hopes." He notices that the work done in Victoria by Mr. French, the Government Entomologist, seems to have been very successful with the Mucor locust fungus. In the Year Book for 1902, just come to hand, experiments on an extensive scale to give the South African grasshopper fungus a thorough and practical test are recorded. There have been some successes, but the general summing up is not favorable. "It now seems probable that very great reliance cannot be placed on this fungus disease. Either it does not work with our grasshoppers as readily as it does with the South African locust, or our climate makes our species of grasshopper more resistant or the fungus less operative."

CONCLUSION.

The parasitic fungus on the codlin moth larva is easily propagated, and the spores are readily produced. The spores may be sprayed in water, at the same time as other spraying mixtures are applied alongside, and the results of both noted and compared. If by this means an epidemic could be spread among the grubs, so as to effectually reduce their numbers, it would be a simple way of dealing with the pest. It would seem, however, that it is only in certain seasons and in certain localities that the fungus is produced in sufficient abunkance to produce noteworthy results, and it could only be used at present as an addition to, and not a substitute for, other means which have proved themselves to be more or less effectual —"Journal of Agriculture of Victoria."

Green fly frequently makes its appearance on young rose shoots. Spray with kerosene emulsion. For mildew, dust the foliage with sulphur in the mornings while the dew is on the plants.

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[*] A millimetre is about 1-25 inch.

[†] Bulletin 25, New Mexico, Agricultural Experiment Station, February, 1898.

[*] A micron is approximately 1-250000 of an inch.

[†] Studies in Artificial Cultures of Entomogenous Fungi. Bulletin 97, Cornell University Agricultural Experimental Station, July, 1895,

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Answers to Correspondents

A Subscriber.—Will you kindly tell me if double flowering Stocks produce seed on their own stem. I had always understood that the double flowers were obtained from seeds saved from full petalled and extra fine single specimens; but I was given some seed the other day certified to be from the double stock plant itself. I should be greatly obliged if you would settle this question in your correspondence column.

The double flowers of Stocks never seed, occasionally get seed from a semi-double flower which appears to one as a double stock. The best double seed is procured from a single stock fertilised from the pollen of a double flower.

The Flower Garden

OPERATIONS FOR MARCH.

By W. S. Campbell.

March is an important time for the gardener for there will be many matters to attend to, and work prepared now will have a great deal to do with the subsequent beauty of the garden.

First of all, there are the bulbs to plant, and the earlier this is done the better, and the greater chance they will have to make roots before the flowering season begins.

Now is the time to plant Daffodils and Narcissi of all kinds, Crocuses, Tulips, Showdrops, Snowflakes, Anemones, Ranunculuses, Ixias, Babianas, Sparax s, the beautiful Watsonia O'Brieni, and other kinds of Watsonia, as well as many other handsome and interesting bulbs. The general rule for depth of planting is to plant as deep as the diameter of the bulbs—that is, if a bulb measure an inch across, plant it an inch deep, and so on; but where the soil is of a dry or sandy nature the bulbs should be planted rather deeper.

If the soil is of a satisfactory condition and not dry plant out Violets, Primroses, Cowslips, Pansies, Polyanthus, Daisies, Carnations, Phlox Drummondi, and any other hardy plants that can be obtained. Get the best kinds of Violets, and for warm places plant only the single flowering kinds, because, except under very favorable conditions, the double varieties are not likely to succeed.

Sow all sorts of hardy annuals, and also seeds of perennials; but the sowing had better take place after the middle of the month.

At the end of the month make ready for planting cuttings of Roses and other plants, for during April cuttings are far more likely to strike roots than during the winter.

Prepare for the planting of evergreens.

A PICTURE FOR AUTUMN.

Plant a Virginian Creeper, the old non-clinging sort, at the foot of a Willow Tree, and allow it to have its way among the Willow branches. Unless the experiment turns out differently from one that I have in mind, a very pretty effect should be given in autumn, when the leaves of the Willow and those of the Virginian Creeper turn yellow and red respectively. The light open growth of the Willow is especially suited to the advantageous display of the Ampelopsis growth and leafage, while the root conditions that suit the former cause the latter to thrive amazingly.—E.J.C.

WATERING SEEDLINGS—A NOVEL IDEA.

A simple experiment which I have lately tried here may be of interest to your readers. I do not know if the idea is new to you, it is so to me. I placed a board across a greenhouse tank nearly full of water, and on this board placed two flower pots (48's) containing an ordinary compost, with broken crocks, &c., at bottom as usual. Into one of these I inserted the ends of two pieces of flat lampwick, about an inch wide, close against the side of the pot and extending to the bottom inside—i.e., between the compost and the pot. The other ends of these two pieces of wick simply dipped into the water. In the second pot I used no wick. This was done three or four weeks ago, and during the whole of this time the contents of the pots in which the wicks are used has been uniformly quite moist (too moist for most things), while the compost in the other pot is absolutely dry. I have not proceeded further in the matter as yet, but am well satisfied with the result so far. The method appears to me to be of wide and useful application, especially for such purposes as that of raising Ferns from spores, where it is so important that the spores should be undisturbed by the somewhat violent process of watering. The degree of moisture to be attained under the above method admits of perfect control, and is uniform and constant day and night. The number and size of the wicks may be varied at will. There is also a practical guarantee that the water thus taken up from the wick by the compost is of the same temperature as the surrounding air. There are also an obvious saving of time and avoidance of any evil consequences arising from neglect. It will be seen that it is desirable to keep the tank fairly full of water, so that the height to which the water must be raised by the wicks shall be as small as possible.

Houston Stewart.

COLEUSES.

These plants are valued on account of their bold and striking foliage, and either for table decoration or for interspersing amongst groups in a conservatory they add a brilliancy that few other plants equal. To the amateur the method of keeping old plants through the winter in the warmest part of the house with a view to propagating from them in spring is often attended with disappointment, for it frequently occurs that just when cuttings are wanted the plants themselves are in a weakly condition; it is therefore much better where only a few specimens are wanted, to resort to the method of raising plants from seed. The additional warmth to be found in a striking pit is just the place for them, and light loam and leaf mould with which silver sand has been mixed make a desirable compost. Young seedlings must be potted on singly as soon as the second leaves have appeared, and further repottings must not be delayed. An addition to the soil of well-rotted cow manure will benefit them considerably. If possible a minimum temperature of 65 deg. should be maintained, and a humid atmosphere suits them admirably; this is the reason why they are so frequently recommended to be grown in houses where Cucumbers are cultivated, owing to the warm and moist conditions which these obtain. To sum up, to have Coleuses in perfection they should not receive a check, but be encouraged to grow, and no better house can be selected for them than a Cucumber house. It is the "express culture" and utilising the sun's rays by placing the pots on a shelf near the glass that enable one to obtain specimens with highly coloured foliage.—Linderslea.

SEEDLING CARNATIONS.

Having grown seedling Carnations for a few years with some success, I think that the following method of culture may be of interest to others who are desirous of cultivating these fascinating flowers. Procure seeds from a reliable source. Moderate sized boxes, measuring about 14 by 10 inches, will be found convenient to use. One inch or more of crocks or cinders should be placed in the bottom and covered with leaves or moss to prevent the soil running down among the drainage. The compost, which should be prepared a week or two beforehand, may consist of 2 parts loam, 1 part of leaf mould, and 1 of sand, and should nearly fill the box; now press the soil lightly with a flat piece of board or metal, and, unless it is already sufficiently moist, stand the box in water for a little while.

Sow the seed thinly in rows about 2 inches apart and cover with about one-eighth inch of fine sandy soil. Now place a sheet of glass over the box and remove to a warm frame or greenhouse, shading the box from strong sun. Tilt the glass frequently to admit air, for if air is not admitted a white fungus is apt to appear on the surface and kill the seedlings when they appear. When the seedlings are through, put the box close to the glass and gradually accustom the seedlings to full exposure to light and air. It is not, however, necessary to have a frame or greenhouse to raise the plants. If neither of these conveniences is at hand, place the box in a warm, sunny place, and bringing it under cover at night. As the seed was sown thinly, pricking out of the young seedlings into other boxes is not necessary. Bring the seedlings that were sown under glass into the open air. When they are hardened, plant them out in a nursery bed about 6 inches apart each way; it will be advisable to shade them for a few days until they are established.

In the autumn a piece of ground in a sunny position should be prepared for the plants. If the ground is already sufficiently manured only a light dressing of wood ashes, burnt earth, or burnt refuse of any description will be necessary; but if the soil is poor a dressing of well rotted manure should be added, and if the soil is stiff some newly slaked lime must be dug in. Remove the plants from the nursery bed and plant in the prepared ground in rows about 2 feet asunder, so as to allow plenty of room for walking between the rows. The distance between the plants in the rows will vary according to their size. When the flower stems rise, drive in a stake at each end of the rows, stretching between them cocoanut cord, which has been seasoned or previously wetted; to this cord tie the shoots—this plan will obviate the necessity for having sticks. As the growth advances another cord or two should be tied above the other. In dry weather the plants may be lightly mulched and a few inches of earth dug from between the rows spread over the mulch; this also prepares the plants (if they are worth it) for layering in the autumn. By this means of cultivation I have had a plant produce nearly two hundred blooms and dozens of layers.

HEDGING.

While walls and fences have valuable qualities of their own, a great deal can be said in favour of surrounding the garden with hedges—the eye is pleased by the preponderance of green, the floral colours show up to best advantage against it, the hedge can be supplemented by a wire-netting fence if dogs are likely to enter through it, while the free passage of air will in most situations be advantageous to the health of the flower and vegetable crops within.

Suppose the garden to adjoin a field in which cattle are allowed, the best deciduous hedge will be one of Quick or Hawthorn, which the animals will not eat: the best evergreen one of Holly. Of course, Holly grows slowly, but time is saved if bushy plants are put in, as these will not need topping to induce thick bottom growth. The young trees should be set half yard apart, or rather less, and ought to be about 18 inches high when planted. The ordinary soil adjoining grass land will do, but heavy clay should be lightened by an admixture of sandy road soil, as Hollies love sand, and are often seen at their best growing out of dry banks. Only trimming into shape afterwards will be necessary unless the base of the young hedge looks bare; in that case the trees should be well topped either in April or September.

A Quick hedge grows on an average 1 foot a year, and should last a century at least. Having obtained good, young, once transplanted Quicks, place them 4 inches apart in a single row, or 6 inches apart for a double one. A trench a spade deep should be enough for the roots, which will be about 6 inches long, and the more fibrous the better. Cover in with sifted soil and tread firmly. In the autumn the hedge should be clipped back to within at least 1 foot from the base, the side shoots being cut also; if allowed to grow tall too rapidly, it will be thin and bare at the base. Sometimes as many as three clippings yearly are necessary, sometimes scarcely any—all depends upon the nature of the young Hawthorns when first planted. It is well to mulch the roots with old manure, and to often stir up the surface soil round about, and no weeds should be tolerated near.

A hedge of the Portugal Laurel (Cerasus Lusitanicus) is out of place at the back of a flower or vegetable border, but is most useful round stables, barns, manure pits, or other outbuildings, as a screen about the kitchen door and tradesmen's entrance, at the junction of a path with a roadway, or adjoining turf, or to make private the back garden by standing at the side of the house parallel with the street. Plant in shade or sunshine, using two bushy plants in each yard, or three smaller ones; add farmyard manure to the soil in the top spit of the trench, and road grit if much clay is visible. Give a mulch of stable manure after planting. Prune closely, using a knife or hand shears, so that only branches and twigs are cut, but the leaves are unmutilated. A Laurel hedge grows very fast, and so does one of the attractive evergreen Thuya Lobbii—indeed, it is claimed for this that it exceeds all other subjects in the matter of speed.

During summer its vivid green forms a delightful background to our flowers, and the foliage becomes bronzed in autumn. The growth is always thick, yet sometimes shoots nearly one yard high are formed in one season, the plants starting away merrily at once. All varieties of Arbor-Vitæ like a good deep loamy soil, and hedges can be made of Thuyas gigantea, Occidentalis, and Orientalis. T. Lobbii will make a very high hedge, of as great breadth or narrowness as desired, but to form a really narrow one (an advantage in some positions) early and frequent clipping will be needed.

A Yew hedge, such as those in which our forefathers used to delight, must never be made where cattle can reach it. Planting may be done in ground trenched three spits deep, putting 18-inch trees only 12 inches apart, or those of 4 or 5 feet in height about 2 feet apart. While Yew hedges often attain to an enormous breadth, as we all know, there is no reason why they should not be as narrow as 12 inches; all depends upon early and constant attention to pruning. The gold and silver Yews make really handsome and uncommon hedges, but it should always be borne in mind that the leaves, whether young or old, are poisonous. Taxus baccata fructu luteo is a yellow berried variety.—M. Hawthorne.

HARDY PERENNIALS FROM SEED.

In my wanderings among gardening acquaintances it has often struck me how very few raise perennials from seed. They may perhaps raise some Aquilegias, but go no farther. They will pay sixpence or a shilling for a plant, when from a packet of seeds one may in due time obtain twenty or thirty; and there always seems to me such an interest in raising ones plants from seeds and watching the unfolding of the first flowers. I sow my seeds in boxes with 2 or 3 inches of broken pot at the bottom, and above this a mixture of leaf mould, sand, and loam; on this when damp the seeds are scattered very thinly, and if large, covered with soil; if small, with damp moss. The boxes are placed in a frame, shaded from the sun, and when the seeds have germinated they are kept close to the glass. After a few leaves have formed, the plants are pricked out into boxes and stood outside, shading from hot sun. They can then be planted in beds. In winter it is advisable to cover with light litter or put in a frame. The following year they will flower, and can then be left in their permanent positions. In this way I have raised Polyanthus, Morina longifolia, Incarvillea Delavayi, Chelone barbata, Centaureas, and Erigeron roseus, and this year I hope to raise many more. Any who attempt to raise perennials from seed will be amply rewarded for their trouble.

LOBELIAS FROM SEEDS.

Many gardeners prefer to propagate their stock of Lobelia plants from a few old ones which have been wintered in pots or boxes; others depend entirely upon seedlings and do not trouble to keep old plants. Very often the latter are lost through damp, then seedlings are acceptable to those persons who do not, as a rule, use them.

I think that seedlings are being used more extensively every year, and I am quite sure that it is a step in the right path, because the selection of strains is now very carefully done, and I have proved this to be the case during the past ten or twelve seasons. I now almost entirely depend upon seedlings for my stock of plants, and find that very few—not more than 3 per cent.—grow straggly; the compact habit and the intense blue of the flowers of a good strain make spring-raised seedlings very desirable.

Whether the number of plants required be few or many, they are soon obtained when the seeds are sown and the resultant seedlings treated properly. Sow the seeds in pans or large pots; they are more suitable than boxes. There must be a constant moisture surrounding the seed-pan, but the young plants should not be kept too damp or else many will quickly perish.

Hollow shaped crocks placed over the holes in the pan and some small cinders covered with leaves make good drainage. Sandy soil which will remain sweet for a long time is the best to use, and as the seeds are so small the surface of the soil should be slightly covered with fine clean sand.

Small Lobelia seedlings, if grown too closely together while in the seed pan, will damp off wholesale unless much care is observed in their treatment, and sowing thickly is a very common mistake made by gardeners. If the seeds are scattered on the soil about one-eighth of an inch asunder the seedlings will have ample room to develop until they are advanced sufficiently to need transplanting.

Good seeds quickly germinate; the soil should be thoroughly moistened with water applied through a fine rosed watering-can, and allowed to drain for two hours before sowing the seeds; then lightly press them down with a piece of flat board, do not put any soil on them, and place the pan in a warm frame which can be darkened. In three days' time hundreds of young plants will be visible, and both air and light must be gradually admitted to them so as to ensure sturdy growth. Instead of applying water on the surface when the soil becomes dry, soak the pan in a pail of water, and the moment the surface soil begins to moisten take out the pan and put it on the stage to drain.

Transplant the seedlings when they are quarter inch high, using fine soil and more pans or boxes. From plant to plant allow a space of 1 inch, and keep them growing in a frame or house in a steady temperature of about 60 deg. One more transplanting should take place, this time putting out the plants in a cool frame at 2 inches apart. In due time nice bushy tufts will be ready for mass planting or for the edging of the beds in the flower garden, where the brightness of the deep blue varieties especially makes a charming contrast to other colours.—Solent.

BANKS TRANSFORMED.

In country gardens more particularly is the need seen for taking in hand banks, often near to the house and on either side carriage drives, &c. If neglected they quickly get into a bad state. If covered with turf it either becomes dried up or patchy, or, as is often the case, is neglected from want of cutting, because one cannot conveniently run the machine over it. Under all the circumstances, banks should come under cultivation to make the most of them, as by planting what is suitable they may be made very effective. No time is better than the autumn in which to commence, and one should see to it that the soil as as deep as possible, and not, as is often the case, have banks made up of all kinds of rubbish. Wallflowers, Canterbury Bells, Antirrhinums, Foxgloves, Primroses, Ivies in variety, are some of the subjects which occur to one as suitable for planting now, whilst in the spring Poppies, Nemophila, Mignonette, &c., may be sown. On shady banks Ferns may be made much of, and Ivies should be planted for an edging.—Leahurst.

EXHIBITING CARNATIONS.

In the first place the flowers must be well grown, and possess all the points that constitute excellence in a flower, viz., substance, smoothness of petal, purity of ground colour, and rich and defined markings. A flower lacking any of these qualities cannot have them added by dressing, the advantage of which is that one can take out soiled, mismarked, or ragged petals and spread the others out so as to show no open space. Again, where there are several overlapping petals, one has the chance to arrange them in their proper places. As long as it states in the schedule that dressing is allowed, it is no fault of the men who dress their blooms if they beat the men who do not. What are our raisers to do with the habitual bursters? They cannot afford to place them all on the rubbish heap.

There is no doubt that all flowers, no

matter to what class they belong, look better when exhibited as naturally as possible. I have been to the midland show on four different occasions. It is, I suppose, the first show of its kind (Carnation and Picotee) in the land where the blooms are staged by the thousand in every conceivable form as button holes, sprays, bouquets, table decorations, dressed and undressed, but the exhibits of Carnations that have impressed me most of all were the non-competitive exhibits put up by Mr. Tom Lord at Old Trafford three and four years ago. They were arranged three blooms of one variety in a vase with long stems, and a few buds and foliage. The flowers were dressed a little, and had very small cards to hold them in position. The cards, however, did not show. It was a superb exhibit, and formed an ideal object lesson how Carnations ought to be shown. —"The Gardener."

SALPIGLOSSIS.

Have you ever seen a bed of Salpiglosses in bloom? My experience leads me to say that there are many who, whilst delighting in Petunias for bedding and vases and boxes, entirely overlook the beauty to be found in the Salpiglossis. Like Petunias, they are possessed of a straggling habit, and it is this informality, together with the beautiful funnel-shaped blossoms, that charms a first acquaintance with them. In one respect they are to be preferred to Petunias, inasmuch as the blossoms are borne on long stalks which are convenient for cutting, but they resemble Petunias in so far as they may be raised from seed sown in shallow pans, the seedlings being pricked off and hardened preparatory to planting out. If you have never grow the Salpiglossis a trial will convince you of its utility and beauty.

PANSIES AND VIOLAS.

Probably there are thousands of old plants of the above now apparently thriving in many gardens, and the owners will be tempted to keep them for use during next summer in the same borders. The plants will not be entirely useless if retained, but they will most likely prove unsatisfactory just when they are required at their best. The long, hollow stalks have not the vigor of younger and shorter ones, and they fail to continue blossoming in a satisfactory manner after the spring of the year is passed. The withering away of the leaves and old stems is more rapid in hot weather, and especially is this the case when the soil is very rich in farmyard manures. In hard and somewhat poor ground the plants will live longer, but the flowers produced are very small.

A stock of sturdy cuttings is a valuable asset where these plants are grown extensively for spring and summer flowering in the pleasure garden. Scotland is a country where Pansies and Violas are largely grown. A head gardener once told me that, when he was a youth just beginning his gardening career, much consternation prevailed in a certain garden one morning after the usual bedding plants had been put out in the flower garden; indeed the work had been finished the day previous, as a severe frost had occurred in the night and ruined the majority of the plants. Fortunately the head gardener had filled a number of borders with Violas and Pansies, and, having a considerable number in reserve, these took the place of those spoiled, and so constituted the main feature of the summer bedding that year So successful were they that for many years afterwards the "fill-gaps" were mostly depended upon as summer bedding plants.

In those days rooted cuttings were nearly always put out; but now we may raise thousands of seedlings in spring which will answer the same purpose. and that, too, at a small outlay. I advise growers to depend upon rooted cuttings and seedlings rather than old plants, especially where whole beds are occupied with the plants

Pansies and Violas certainly thrive best in a cool, rich soil. I have seen very striking beds of them growing in almost pure sand, and that, too, under a hot sun. In these days the plants are chiefly grown to form a groundwork under taller subjects, such as Fuchsias, Liliums, Ivy-leaf Geraniums, and many other kinds.

During the winter cuttings which were put in in autumn should be examined once each week and the soil gently pressed around them, and afterwards the surface lightly scratched over with a pointed stick. Every batch of seedlings should be examined in spring, and if there are any amongst them which are throwing out runners destroy such forthwith, as they will spoil the appearance of the whole later on. A good specimen should be compact and sturdy.—"The Gardener."

VIOLETS.

Few flowers are more generally appreciated than the fragrant violets, and especially are they beloved in the dull days of winter and early spring. The time is now approaching when plants growing in the open will have to be lifted and transplanted. Although the cultivation of violets is a simple matter, yet to ensure a supply of fine flowers during winter requires some amount of preparation and attention to various details throughout the year.

The method of propagation usually practised is that of dividing the plants which have done duty for one winter. The young crowns, each having roots, are then planted on a prepared plot of ground in rows, and watered at the roots and overhead as often as necessary. Syringing should be performed three or four times a day to promote quick root action, and a slight shade will prove helpful to the newly planted crowns until they have established themselves. A border under the garden wall facing north is a capital place for the plants, as the sun does not then play upon them during the hottest part of the day. Frequent syringings are not only conducive to robust growth, but assist in warding off attacks of that dreaded pest—red spider. Weeds and runners must be kept down, and early flowers should also be assiduously picked off, or they will rob the plant of nutriment which should now be concentrated on the main crown. The soil I find suits violets well consists of two-fifths leaf-soil, two of good garden soil, and one is loam, adding some road-grit or river sand as thought necessary to make the whole porous. About 8 in. depth of soil is sufficient for the plants, but the latter should be brought as near the glass as possible without touching it. Violets delight in abundance of air and light, therefore abundance should be provided so far as the state of the weather permits.

Do not bury the violet crowns, neither plant them so that they are set up above the ground. Afford sufficient room from plant to plant to allow of free development of the leafage, and to admit air and sunshine. When planted give a good watering, and keep the structures close for a week or so, when air should be gradually admitted until, finally, the lights may with advantage be removed entirely on fine days and evenings. The aspect of the frames should be south or south-west, so that the maximum amount of light may be secured. Damp, foggy weather is very harmful to violets during winter, and great care must be exercised in admitting air at such times, or the leaves will decay and the flowers will open imperfectly; at the same time, I do not advise keeping the frames close, but air must be cautiously admitted.

A stimulant is highly beneficial to them during active growth, and this may be continued up to within a few days of lifting. With reference to suitable manures for them, I depend chiefly upon the drainings from the farmyard, but an approved artificial fertiliser may be given occasionally, afterwards using only clear water for a few days.

GRASS GARDENS.

The charms of bulbous flowers are never better exemplified than when the blooms are seen rising from the soft green turf and swaying in the slightest breeze that blows. Their popularisation for this purpose is largely due to the admirable manner in which they have been employed in the botanic gardens in various parts of the country, notably at Kew, where the annual displays rank with the most beautiful horticultural features of the year; to the splen-

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did effects that the superintendents of our public parks and gardens have made, one of the finest London pictures being in Battersea Park; and to the strenuous support that the system has received from such leading lights in the world of gardening as Miss Willmott, V.M.H, and Mr. William Robinson. These enthusiastic amateurs have put Daffodils in the turf of their estates in all directions, and the results are beautiful beyond description in the spring of the year.

It is, unfortunately, not possible for every one of us to plant bulbs in the numbers that we see in the places adverted to in the preceding paragraph, for the simple reason that our gardens are not sufficiently large to allow of it. We may, however, all do a little in the right direction by utilising the bulbs which have been flowered in pots, and which are too frequently thrown away, for positions in the grass where the ragged appearance created by the dying leaves of the bulbs and the coarse condition of grass consequent upon neglect of cutting is not deemed too serious an eyesore. Herein lies the one disadvantage that accrues to the cultivation of bulbs in grass, for it is imperative that the foliage be left upon the plants until, having turned quite yellow, it has obviously fulfilled its functions and may be removed. This process of perfect maturation, which is so essential to success, involves delay in mowing, hence the undesirableness of planting bulbs immediately in sight of windows, where the untidiness would naturally be intolerable.

Passing a short distance from the parterre, which is always kept trim and tidy, so as to be in harmony with the external appearance of the house, there will probably come a bend in the grass with a background of shrubs and trees, and it is from just such spots as these that the greatest value can be derived in grass gardening, for the visitor treading the smooth turf will turn quite unexpectedly upon a picture of golden Daffodils or gorgeous Tulips, whose flowers, with their soft background, will astonish and delight him beyond measure. Here the long grass does not irritate by its unkempt appearance, but is gladly tolerated because it adds substantially in producing one of the most charming corners of the garden in spring.

It has already been said that the bulbs which have done a season of excellent service in the greenhouse are of the utmost value for planting in grass, and, unfortunately, some persons appear to think that because old bulbs are being utilised it becomes little more than a waste of valuable time to give care and thought to good and effective work. This is not, however, the way to set about any gardening operation, or it is certain that failure in a greater or lesser degree will be the lot of the gardener. Success demands that each detail shall have proper attention, and grass gardening affords no exception to the rule.

The commonest error of all is that which results in the bulbs being planted in lines, and thus tends to bring the formality of the flower garden beyond its sphere. Straight lines or regular curves should be avoided, and the planting must be so done as to give the possible idea of natural growth. This is by no means an easy thing to do, more especially where the amount of space available for the purpose is at all limited. The most satisfactory results have been found to follow upon the studied neglect of any suspicion of a plan, and this is best ensured by standing some little distance away from the place that is to be planted and, taking a good handful of bulbs, throwing vigorously so as to make them scatter as much as possible. Or, as an excellent alternative, stand in the centre of the area and throw the handful of bulbs high above the head, giving the wrist a rotary motion at the moment of ejection. In both cases the subsequent movements will be the same, and will consist of putting each bulb into the soil where it fell.

Some objection may be raised to this practice on the score that there is a liability of many of the bulbs being lost through its adoption, but, as a matter of fact, the danger in this direction is slight, and if one or two do go astray it will not be a serious matter, as the varieties which are usually requisitioned for the purpose are not generally the expensive ones, but rather those which can be bought very cheaply. Again, the shortness of the grass in autumn when the planting is done favors the ready finding of every bulb by an operator who exercises a reasonable amount of care in his work.

In the distribution of the bulbs in the manner indicated, one has to take into consideration the space at command, and whether it is desired to have masses of one kind or variety, or a mixture of as many as can be got together. There can scarcely be two opinions as to which system will produce the more striking effects, and that is separate masses. But this means that a fairly extensive amount of room must be accorded, as two or three bulbs of a variety are apt to look somewhat forlorn in their splendid isolation. Let the determining factor, therefore, be size and nothing else, having masses or mixtures just as the space will allow. If the latter is the only feasible plan, then mix Tulips, Crocuses, Snake's Head Lilies, and Daffodils in one basket, whence they may be drawn for distribution in handfuls that are as varied as they can be made without attempting anything in the way of selection.

The actual planting demands skill, care, and the use of proper tools. It is first of all necessary to cut out the piece of turf beneath the waiting bulb, and then to substitute for the soil some sound loam if it is thought that the natural mould is at all poor. Next the bulb or bulbs will be placed in position precisely as one would do were the work being carried out in the flower beds and borders. After the covering of soil, new or old, as the case may be, is put on, it only remains to replace the piece of turf that was removed before the work may be said to be completed. The requisites are, then, a sharp turf cutter, a barrowload of prepared soil, and a cartload of common sense, which will ensure the results being in all respects satisfactory to every one. It is somewhat tedious work certainly, but it will thoroughly repay for all the time spent upon it. For those who would have a turf cutter and a soil excavator in the same tool there is nothing to equal the admirable implement that has been invented by Barrs for this express purpose, as it is easy to handle and does its work in a perfect manner.—"The Gardener."

AN ENGLISH BOG GARDEN.

Some twelve or fifteen years ago in a corner of the grounds at Wolseley was an untidy swamp, a disused pond, about a third of an acre in extent, surrounded by high banks, and beyond these by lofty trees and a few shrubs. The middle part was a regular swamp, overgrown with tall Nettles and common Sedges. In my childhood I can remember it used to be called the "Wilderness," and in the lofty Elms was a strong colony of rooks; these, alas! have long since forsaken the spot. Many were the suggestions for converting this untidy spot into something more beautiful. Some suggested a rock garden, but there was too much shade; others the re-making of the pond, but there was already quite enough water about the place, the River Trent flowing within a few yards of the house, and there being another fish pond close to it. At last I happened to come across "The Wild Garden," and, after reading therein the charming descriptions of plants naturalised by brookside and in the bog garden, I formed the idea of converting this wilderness into a semi-wild bog garden.

The first thing was to cut a winding ditch through the centre of the bog, and this has ever since been a running stream, bordered with Ferns and other plants, and another ditch round the outside of the swamp to drain it, with a rough pathway all round and one skirting the stream through the centre, and to construct some rustic wooden bridges over the ditches. Then I planted several good clumps of Rhododendrons, a fair-sized clump of scarlet Dogwood, a few clusters of hardy Bamboos, and a few shrubby Spiræas. I also planted with Azaleas a good-sized mound, raised from the soil out of the ditches. These formed the foundation for my bog garden, and between these clumps and on

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JOHN CRESWELL, Secretary

each side of the ditches I planted numerous patches of herbaceous and bog plants. Many of the former were obtained from the thinning out of the herbaceous border, and many more of both these and the latter were procured from the different woods and swamps about, such as Ferns, the brilliant Marsh Marigold, the common yellow Flags, Meadow Sweet, Loosestrife, some of the prettiest of the Sedges and Reeds, and many others. Then in the autumn I purchased several thousand bulbs, the banks being planted with Snowdrops, Winter Aconite, Snowflakes, Crocuses, Bluebells, Grape Hyacinths, Scillas, &c., whilst the sides of all the ditches were planted with Daffodils and Turk's Cap Lilies. In the north-eastern corner, from which one enters into the bog garden, I made a rough rock garden, and this is covered with various kinds of Ferns, and here the Oak and Beech Ferns flourish and seem really "at home," as also the Hart's Tongue and several other species.

Of course, as I put in all sorts of plants and bulbs at first, regardless of their suitability for the situation, I had many failures, and many died, but quite enough survived to encourage me to persevere, and gradually the untidy swamp assumed an appearance of beauty; and possibly now many would consider the bog garden the most interesting and beautiful part of the gardens. Many a plant which I have tried in vain to grow in the ordinary herbaceous garden here not only lives, but flourishes with scarcely any care. Phloxes, Delphiniums, Monk's Hoods, Asters, Day Lilies, Plantain Lilies, Torch Lilies, and, above all, the Trilliums or Wood Lilies, the Evening and other Primroses, all flourish here; nor must I forget the Japanese Iris, or Iris Kæpferi, which also does exceedingly well. Early in February, just as the snow disappears, some of the banks are clothed in white by the Snowdrops, with here and there a bright patch of Winter Aconite. Then, following these, the other banks break out into a mass of various colors as the Crocuses appear, and these again are succeeded by a mass of blue from the wild and Grape Hyacinths. Later on clumps of Tiger and Orange Lilies appear on these banks, then all along the ditches and other parts of the bog garden appear rows and groups of yellow Daffodils, followed by the Jonquils and Pheasant's Eye Narcissi. In other parts are groups of Primulas, Cowslips, Tulips, and the brilliant-colored Marsh Marigold. Then one of the most successful effects is when the mass of Primula japonica comes into bloom, this plant growing like a common weed with flower-stalks 2½ ft. high, and seeding itself in all directions, whilst amongst the scarlet Dogwood the ground is covered with the pretty little pink Claytonia, with here and there clumps of the graceful Solomon's Seal. The Ferns also luxuriate in the boggy, peaty soil; the common Lady Fern grows to a gigantic size, the Osmundas also, and the Onocleas, but, towering above all, the Ostrich-feather Fern (Struthiopteris germanica) here attains the extraordinary height of over 6 ft. In July, amongst the Ferns, and in large groups near them, appear gigantic white and spotted Foxgloves, forming, perhaps, one of the most striking effects of all. Then come the graceful feathery Spireas, the most beautiful of which to my mind is the crimson Spiræa palmata, which grows ulxuriantly here. I must not omit to mention here the Californian Saxifraga peltata, which lines one of the ditches in front of the Ferns, and grows nearly 5 ft. high, with its broad, tropical-looking leaves. I had great difficulty in establishing the Gunneras, but have succeeded at last, and they form quite a picture by the side of the stream in front of a tall group of Bamboos. In August some fine clumps of Phloxes and the Golden Rods produce some bright coloring, and, finally, in September and October, appear the Torch Lilies, and some grand groups of Asters to finish up with.

Almost every week the picture changes, and for ten months in the year some part is bright and gay with flowers, and, even in December and January, the scarlet-barked Dogwood gives a bright and cheery effect, contrasting with the dark green Rhododendron clumps. This garden is a source of continuous amusement and and, as I not only planned and constructed the whole, but also do all the work of replanting and weeding myself, I look upon it far more than any other part of the gardens as especially my own garden.

C. W. Wolseley, "Gardening Illustrated."

AURICULAS.

Auriculas may be divided into three classes—namely, alpine, border, and show. The two first are charming garden flowers, but the last can only be successfully cultivated in pots. Alpine Auriculas are divided again into two sections, those with grey or white centres, and those with yellow centres. A native of the high Alps, the Auricula is by nature a perfectly hardy plant. Old specimens of border varieties may be met with in gardens that have been undisturbed for years, and have formed large tufts both on stiff clay soils and in a lighter and more porous staple. These old plants are best divided, lifting the entire clump carefully, shaking it free of soil, and parting each separate crown, which should at once be planted in fresh soil. In raising from seed, this should be sown in boxes in the early spring in a gentle heat of about 50 deg. Good drainage should be provided, and over this fibrous loam and leaf-mould in equal proportions placed, the top inch of the compost being a mixture of leaf-mould and sand. When the seedlings are large enough to handle they should be pricked out and placed 2½ in. apart in other boxes or pans, removed to the open air, and planted out in a partially shaded border after mid-summer. In scorching weather artificial shade is beneficial to the seedlings. These remarks apply to the alpine and border Auriculas, and not to the show varieties, which are always grown in pots.

Every one who grows Auriculas should raise plants annually from seed, for it is a sportive flower, and there is always a chance of raising seedlings that are far more beautiful than their parents, and in this manner strains may be immensely improved in the course of a few years. As better varieties are obtained, the washy, badly-coloured, or weak-habited plants should be weeded out. What is required of a border or alpine Auricula is clear markings, bright color if a self, sturdy, erect stems, and free-flowering habit, and in these there is still room for further improvement if careful cross-fertilization be practised. Show Auriculas are divided into five sections—namely, selfs, white-edged, grey-edged, green-edged, and fancies, the last section including flowers that, though often pretty, may not be admitted into any of the other four sections. The foliage of the show Auricula is covered with a mealy substance, and portions of the flowers with a white, floury powder. Thus the centre of the flower is yellow; this is surrounded by a ring of farina, outside of which is a ring of dark color, beyond which is an edging of green, grey, or white. This outer edging is, in fact, a development of leaf-like properties in the petal. In the green-edged this is unpowdered, but in the grey-edged and white-edged the green is covered with a white powdering, the density of which powdering constitutes the difference between the white-edged and the grey-edged sections. Alpine Auriculas are destitute of powdery matter on their petals, as are those of the border section, which may be termed less refined alpine Auriculas.

S. W. F.

ZONAL GERANIUMS.

Skilful watering and thorough ventilation are the two principal factors in the successful cultivation of Zonals. Always use tepid water, as cold water is apt to check the delicate roots. Only give water when the soil is nearly dry, then afford as much as the pots will hold, and wait until they again get nearly dry before giving more. On no account get into the habit of hovering over the plants with the water-can, giving little drops here and there. Nothing is more detrimental to the well-being of the plants.

When convenient it is a good plan to water in the morning, as then the surplus moisture is dried up before night. This practice, coupled with proper ventilation, goes a long way in preventing mildew, the great bane of Zonal growers. It also helps to prolong the life of the blooms.

In regard to ventilation, we can scarcely give too much air, provided, of course, we avoid draughts. Whenever the weather permits leave the top ventilators and the door wide open. The frame lights must also be raised whenever possible, it being most important to allow free circulation of air among the plants. In damp, chilly weather it is advisable to warm the pipes and give top ventilation rather than shut the house and frames close, a still, stagnant atmosphere being fatal to successful culture.

Fertilising, with subsequent raising of plants from seed, is perhaps the most interesting of all the various stages in the culture of Zonals, and provided judicious selections of varieties are used for this purpose very fair results are to be obtained. The beginner must not, however, expect to obtain many advances on existing varieties, as such splendid work has been done in this direction that the field is now somewhat limited. There is always the chance of raising something superior to existing sorts, and it is this chance that gives zest and fascination to this most interesting of all gardening operations.

The plants intended to be crossed should be two years old, strong, healthy, and of good habit, with large trusses of bold, well-rounded pips. Midsummer is about the best time of the year to commence operations. Having selected the plant which is to bear the seed, remove the stamens from the flowers before the pollen becomes ripe (to prevent self-fertilisation), and when the pistil is matured, that is, when it becomes sticky and reflexed, apply the pollen from the other selected plant to it, by means of a camel hair brush. Several blooms of the same plant may be so treated, the remainder being removed. Pinch out the growing points of the shoots and cover the plants with fine gauze to exclude insects.

The seed so obtained should be sown, as soon as ripe, in pans of sandy compost. Transplant the seedlings early into small thumb pots, and when the roots are seen to be going round the ball shift the plants on into 5-inch pots, in which they may be allowed to bloom. Use a compost as advised for the final potting of plants from cuttings. The subsequent treatment of seedling plants is similar to that of the other batches. The majority will probably come into flower early in the following summer, or, if more convenient, the seed may be sown the following spring for late autumn flowering.

Zonals grown as standards make very fine decorative subjects. Some of the seedling plants are well adapted for growing in this way, as their stems are naturally straight and stout and run up rather tall before branching. They also form suitable stocks on which to graft other varieties to form standards. Plants from cuttings may also be used and trained into standards. In this case all lateral growth must be removed as soon as formed until the desired height is reached. From 24 to 30 inches from the ground line will be about the right height. At this point pinch out the growth and bloom bud. When the resulting shoots are some 3 inches long again pinch out the growing points. Continue this stopping until a fine head is obtained. This must not, however, be done in a haphazard way: some care is necessary, in order that all the branches may be properly disposed, so as to admit of free circulation of air among them. As the stem has to bear considerable weight it will require a fairly stout bamboo stake for a support.

To promote quick growth, standards require generous treatment, and to be shifted on into larger pots according to their growth. A fully grown plant with a head some 2 feet through may need an 8-inch pot. When growing freely, assist with frequent waterings of weak liquid manures, and when the plants come into flower, stop the growth points one joint beyond the blooms to throw the whole energy into the trusses.

After flowering, turn the plants out of their pots, remove nearly all the old soil, shorten the old roots back, and repot. The fine old scarlet Hyacinth is of outstanding merit grown as a standard. Its growth is peculiarly well adapted for forming fine symmetrical heads, and it is a very free bloomer. The trusses are of immense size, standing well up above the foliage. Miller's Favourite, another old variety, is of almost equal merit.—W. H. Cook, "The Gardener."

LILIES AND ROSES.

In the height of the summer, when the two rival queens of the garden, the Rose and the Lily, are disputing sovereignty, border and bed, porch and trellis, are bright with countless flowers, beautiful indeed, but falling short of them in loveliness. Lilies and Roses associate charmingly with one another. The Crimson Rambler, whose somewhat crude coloring renders it objectionable where other bright tints are present, is handsome when seen with only a complement of green, as where its blossoms drape an archway having a background of full-foliaged trees, while a trellis covered with this Rose in full flower, fronted by a wide row of Madonna Lilies, furnishes a striking and pleasing contrast. Of the summer-blooming, so-called "garden Roses," there are many, notably the old Cabbage Rose, Maiden's Blush, the pretty little De Meaux, the striped York and Lancaster, the white Provence, and others which all form good bushes, as do the Austrian Briers, single and double, the Persian Yellow, and the Penzance Briers. In climbing Roses suitable for covering porches, verandahs, trellises, or even for clambering to the top of small trees, we have a wide selection. Our Dog Roses of the hedgerows testify to the beauty expressed by the rambling Brier, and other wild species will succeed equally well with us, but it is chiefly to the varieties raised from these wildlings that we owe the soft colors with which the climbing Roses mantle pergola and porch. Rosa polyantha, besides its charming type known as R. polyantha simplex, and its larger form grandiflora, has given us the pink Euphrosyne, the nankeen Claire Jacquier, the flesh-pink Psyche, the white Thalia, the pale-yellow Aglaia, the pink Leuchstern, and the deep-colored Crimson Rambler. From the Ayrshires, or Rosa arvensis race, we have the white Bennet's Seedling, and Dundee Rambler, white shaded pink. The Evergreen or sempervirens section has provided the pink Flora, the white Felicite-Perpetue, and the pale pink Myrianthes Renoncule. The buff Garland Rose and the white Mme. d'Arblay are hybrid Musks. The glorious Carmine Pillar, glowing crimson, and Longworth Rambler, light crimson, are hybrids, while of Hybrid Teas we have the vigorous Reine Olga de Wurtemburg, bearing great semi-double, light crimson flowers, and making shoots 12 ft. and more in length during the season. Teas and Noisettes also furnish us with many strong-growing climbers, such as Mme. Alfred Carriere, cream-white, Mme. Berard, salmon, and Waltham Climber, light crimson, in the first section, and such varieties as the white Aimee Vibert, the copper-yellow Reve d'Or, and the apricot W. A. Richardson in the second, while in the warmer localities the white and the yellow Banksian Roses may also be grown.

In Lilies, although the peerless Madonna Lily holds the first place, there are many others that are of easy culture in the border, such as the common Orange Lily (L. croceum), the many named varieties of the comparatively dwarf-growing L. bergianum or elegans, and the L. umbellatum section, ranging in color from lemon-yellow to crimson, the buff L. excelsum or testaceum—a hybrid between L. candidum and L. chalcedonicum, L. Martagon, and its white for, the scarlet Turk's cap (L. chalcedonicum), the Tiger Lilies, of which the best are L. tigrinum splendens and L. t. Fortunei. L. Henryi, called the yellow speciosum, is also a vigorous Lily, but at present rather expensive. In some gardens many other Lilies are found to flourish, L. auratum, L. speciosum, L. longiflorum, and L. Browni becoming permanently established, and even the lovely flesh-pink L. Krameri doing well and flowering freely, but these are not to be relied on, as are the earlier-named species. The pale yellow L. Szovitzianum will generally, though not always, succeed, and in deep soil the noble Giant Lily of the Himalayas (L. giganteum) forms a splendid picture.

S. W. F.

LILIUM GIGANTEUM.

If the Rose has any real rival in the realm of flowers the Lily must be accorded this proud distinction; for no other flower can come near it in the affection and admiration with which it is viewed by its admirers. Opinions may differ as to which is the most beautiful Lily—and there is room for some difference in this—but there can be none as to which is the most stately and imposing of all. There will be a common agreement that it is in L. giganteum that we have the noblest of all the race. Rearing its gallant stems to a height of sometimes as much as 16 feet, it is truly a "giant" among its compeers, yet it is absolutely wanting in the ungainliness we so often associate with the term. There is no want of proportion in the plant—from the great heart shaped, glossy leaves, shining as if varnished, the stout stem, to the noble spike of flowers, which crowns its summit, each is in proportion.

Like the others of the small section to which it belongs, the bulb of this Lily dies after flowering, so that the succession is kept up by the offsets which it produces, and which attain a flowering size in, generally, from two to four or five years. The best spikes are given by the older bulbs, and those which flower the second year generally throw up short and unimposing spikes of bloom. The offsets should be taken off and planted out in the place in which they are to bloom, which should be in a sheltered position not exposed to high winds, and in good well-manured soil. If bulbs are bought they should be planted whenever they are received.

NEW ROSE RICHMOND.

While at St. Louis recently I had the opportunity of seeing the E. G. Hill Co.'s new rose Richmond, and, as shown there, while very beautiful, I thought some of the flowers might have been better, but I found out afterward these had been seriously delayed by the express company. Nevertheless, the variety won the silver cup in the class for any new rose.

Going on to Chicago the following week, I saw it again in much better condition, but if one wants to view it in all its glory, he should visit Richmond and see it growing. I spent a day there and was more than repaid for the trip. One house, three hundred feet long, is planted with the above-named variety, flowering as free as any rose I ever saw; in fact, I don't remember seeing before in a rose house so many flowers and buds, with stems strong and vigorous, about one and a half to three and a half feet in length, and of such a beautiful crimson color, without the least trace of black or purple. I had been told it was a good rose, but I had no idea of seeing it so fine as it is. Mr. Hill has never said half enough in its praise. And I venture to say the days of Liberty are numbered, for as soon as Richmond is distributed all other reds will soon be forgotten.

W. Duckham, Florists' Exchange.

PLANTING FLOWERS AND FERNS ON WALLS.

Take two cupfuls of very fine, dry soil passed through a sieve, place in a basin, and make into a moist cake with water. Continue to stir this while you sprinkle all over it hardy Fern seeds, rock plants, Wallflower, Snapdragon, and other seeds, of which any seedsman would give you a mixture. Mix all well together, and then place very minute dabs of it into small fissures in a wall that is, if possible, backed by a bank. Have another basin of moist soil and fill in the cavities with it with a round-topped knife, putty knife, or oyster opener.

ROSES GROWING IN THE DRAWING ROOM.

The question is often asked, "What flowering plants can be successfully grown in living rooms by those who have no conservatory or greenhouse in which to prepare them for house or table decoration?" The way in which I have solved this problem for myself may help readers who are anxious for something brighter than foliage plants or hardy ferns.

Last year I determined to try pot Roses for this purpose, and found them most satisfactory. I procured several Tea Roses (principally Niphetos and Marechal Niel) in small pots. I placed them in a wide, deep bay window with a south-east aspect, giving them all the sunshine possible, dewing them overhead with tepid water on fine, mild days, and always removing them from the window sill on frosty nights.—A. Bird.

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SOMETHING NEW IN WINDOW BOXES.

The something new was in the filling, not in the boxes themselves, for they were the ordinary oblong tile and wooden structures which one sees on scores of window sills. The filling, however, was so uncommon that I ventured to inquire as to its inception. This was in November, and I was told that in the previous March a packet of grass seeds had been purchased and sown upon carefully firmed soil on almost a level with the tops of the boxes. Some strands of black thread had kept birds at bay until the seeds had germinated, and subsequent clippings with a pair of scissors had formed a level turf of the brighest green. Watering had not been required, thanks to the wet season, and the owner, in proudly contemplating the six boxes ranged round two bay windows on the ground floor of his house, was of the opinion that no window boxes in all London had been so cheerful as his own for so long a time and with such little trouble and expense. Snowdrops, Chionodoxas, Crocuses, and Scillas were destined to spangle the grass with blossoms in spring.—E.J.C.

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WISTARIAS ON TREES.

Most of us are familiar with Wistarias on walls, and some of us may possess a Wistaria decorated arch; but how many of us number Wistarias on trees among our acquaintances? Now here is a chance for those who would possess a garden feature different from their neighbours. Obtain a healthy plant in a pot, take out a good depth of soil beneath the selected tree (this will not harm the tree), replace it with a rich compost of loam and rotten manure, and plant the Wistaria firmly. Fasten the growths to the tree to give the Wistaria a good start, and after that leave it severely alone, excepting for a good soaking if the summer should prove a dry one. With ordinary care a very pretty effect may be secured, even on the common Laburnum seen in so many small gardens, while owners of large trees may obtain even finer results. For the encouragement of the timid, I may mention that I was incited to pen this note by seeing some fine specimens of Pinus Coulteri and Abies Douglasii wreathed to the height of 50 feet in blue and white Wistarias at Mr. Anthony Waterer's famous nurseries.—E.J.C., "The Gardener."

ARRANGING DAHLIAS IN VASES.

Each section of Dahlias seems to have its allotted place in indoor decorations, and for this reason it is well to consider where the different types of the flower may be seen to advantage. Most gardens possess a few plants of some form or other of this useful flower, and as they blossom so freely one is rarely at a loss to refill the vases and other receptacles, when their somewhat fleeting beauty is over.

The large double flowers of the show and fancy types are very handsome when at their best, and a bold effect may be made with a dozen flowers in a large vase. But for such work they should be cut with long stems and a few pieces of foliage attached, with a bud or two to stand out from this to relieve the heavy character of the arrangement. Of course, plants grown for exhibition would be severely disbudded, everything going to size; and because of this fact it might be a difficult matter to secure additional buds. However, in most gardens sprays of the kind I have just described may always be had. The stems may be kept in position by inserting between them nice fresh pieces of green moss. On no account bunch the flowers together, but instead arrange them gracefully, so that each bud, flower, and piece of foliage can be seen. It is surprising what a splendid vase may be arranged in this way, a dozen sprays giving a rich effect. The fact that the blooms are cut with their own foliage adhering to the long stem is ample embellishment in the way of foliage. Small vases and specimen glasses, each to contain one specimen bloom, are seen to advantage on the mantelpiece or dotted about on the dinner table, and in the numberless ways in which small utensils are now used. The Cactus and decorative types of the flower are each year becoming more popular, and deservedly so. The Cactus type of the flower is very pretty and effective.

A table decoration composed exclusively of the Cactus Dahlias makes a superb arrangement. There are so many warm tints of color, which, seen under artificial light, produce rich effects. For a centre-piece, or any of the larger vases on the table, long stems with foliage and buds become a necessity; but these are easily fixed in position with a little Moss. A much better effect is obtained if each type of the flower be arranged by itself, the beauty peculiar to each kind being by these means better appreciated. For this reason the Pompon and the single-flowered sorts are the best. The former are always very pretty by themselves, and being so neat and so freely produced the supply from a few plants seems almost inexhaustible. The single, unfortunately, fall soon, but for an evening's display they last well indeed, and make a pleasing change.

When arranging the colors the selfs may be associated together, and an opportunity afforded to make a change with some of the fancy-colored sorts on another occasion. The yellow, orange, fawn, and crimson flowers are magnificent under artificial light, while the white, pink, and light shades of color are seen to advantage during the day. Flowers of lilac, rose, and magenta look well under artificial light, and either one of these colors by itself, with white for a contrast, is effective.—T.

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VEINS IN PLANTS.

In the study of plant life the veins or the channels of supply which permeate the systems of most vegetative structures, are of extreme interest. Just as in our own bodies, we find them pervaded by blood-vessels which carry the nutriment provided by the food to all parts, and remove the debris of wear and tear, so can we see if we examine a leaf or a section of living bark that here, too, are channels built up within their substance, and obviously for similar ends. There are, however, material differences, the main one of which is that, while with us the veins are not supportive parts of our structure, in plants they so far serve that purpose, as they are frequently associated with woody secretions, and by their tubular formation are stronger than the intervening membranes of simpler cell structure. Thus, if we hold up a leaf to the light we shall see a beautiful network starting from the main stalk and branching out into slenderer and slenderer ramifications and twigs, as it were, until near the edges they fade away into invisibility; and in and among this reticulation of veins, large and small, we shall see translucent lines between the cells which carry the network a step farther. Every leaf, even in the same tree, will vary in detail, though adhering to a similar general plan, and every species has its own specific character of venation, just as it has of leafage, flower, and habits of growth. In mono-cotyledonous plants, however, the vein system is not a netted one, but one of long parallel lines, as we may see by examining any of the tribe from the grasses to the lilies, or the palms; in one and all, if we tear a leaf lengthwise we shall find it tear into strips, while in the dicotyledons, owing to the network arrangement, the tear will be ragged, and in no definite direction. In ferns, which constitute a third branch of the vegetative kingdom, since as cryptogams they bear no cotyledons proper at all, a great number are net veined, and in many cases so beautifully that the venation is distinctly ornamental. In some cases, however, the venation is simply dichotomous, or forked one or more times, the primary veins starting from the mid-rib and forking again and again until they reach the edges. Undoubtedly many of the variegated forms, crested and plumose, are due to this forking being carried abnormally far; each limb carrying nutriment and building up foliar structure beyond the normal lines, so that tassels and extra feathery fronds result therefrom on plans which vary with the mode of furcation. As in ferns it is one of the primary functions of the veins to form to sporangia or spore heaps, which naturally absorb and concentrate within themselves a large amount of nutrition, we can easily see how barrenness, absolute or comparative, must almost of necessity result when the veins extend themselves abnormally and build up extensive foliar structures outside the normal plan. Usually the frond growth is completed before the spores have assumed definite shape, the vein's work on the frond edge is done, its terminal is sealed, as it were, and all the subsequent nutriment goes to the fashioning of the reproductive spores. In some of the varieties, however, this terminal sealing seems to be beyond the plant's powers; the channel remains open, and terminal growth continues indefinitely into fringes, tassels, or pinnular extensions, such growth continuing even a second season should the fronds not be deciduous, or, as in the case of Athyrium filix-fœmina uncoglomeratum, even if they be, the vitality in the terminal cells persisting aposporously, despite the death of the rest of the frond. In the lower orders of vegetation—the fungi, algae, clihens, &c. there are no veins; they are non-vascular, as it is called. In these all the functions are fulfilled and needs supplied by transfer from cell to cell of the nutriment provided by the mycelium or surrounding elements. It is the evolution of the vascular system which has ennobled the vegetable kingdom, and given us all the prizes, save those of the fungologist, bacteriologist, and other logists of its more or less hidden domains.

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MICHAELMAS DAISIES.

Some few plants in our gardens have special claims upon us, and we give them attention on the approach of their blooming seasons. We may mention in this connection Roses, Carnations, Chrysanthemums, then why not specialise a little more the Michaelmas Daisy? Who thinks of feeding it with liquid manure, or disbudding it, or even tying it up properly? Few, I fear. We somehow think that any scant treatment will do for this hardy autumn flower. I suggest to those who have not tried the plan to notice the difference in plants that are manured, buds thinned, and staked properly, as against neglected roots. —LEAHURST.

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A BRAMBLE BANK.

The coldest and most exposed of banks can be beautifully adorned by varieties of Bramble. The double white-flowered Rubus fruticosus gives clusters of snowy Rose-like blossom from the end of June to late autumn. It will thrive anywhere so long as its roots have a sufficient depth of soil, and may be propagated by cuttings or suckers. As it flowers on the growth of the previous year, the old wood should be cut out each autumn, just as the Raspberry canes are treated. There is a very pretty double pink variety, that was originally found in some French wood. Rubus odoratus has pink blossom late in the year, and fine foliage, and a white variety is also obtainable. R. phenicolasius is the handsome and useful Wineberry; R. lacinatus, the Parsley-leaved Bramble, is exceedingly ornamental; R. Wilson Junior is one of the earliest fruiting Blackberries, rivalled only in this respect, I believe, by Lawton.—M.H.

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TO PRESERVE CUT FLOWERS.

Use rain water, clear and fresh, not the stagnant, muddy stuff one often sees in tubs outside dwelling-houses. To this a small lump of charcoal should be added if the receptacle will not betray its presence in an undesirable manner; where this is the case, methylated spirit may be used instead. This is highly important with arrangements which have called for so much skill in constructing that their disembodiment is not a thing to be lightly undertaken for the renewal of the water.

The Orchard.

INOCULATING THE SOIL.

THE WORK OF NITROGEN-FIXING BACTERIA.

The following very interesting article on "Soil Inoculation," written by G. H. Grosvenor, in the "Century Magazine," we take from the "Queenland Agricultural Journal."

Most people in this State have heard of the attempts to enrich the soil by means of nitrogen, but few know the reason for its failure, and fewer still of the brilliant success achieved in this direction by Dr. George T. Moore, who is in charge of the Laboratory of Plant Physiology of the Department of Agriculture of the United States of America. We give the full text of Mr. Grosvenor's account of this wonderful discovery, which is now attracting the attention of the whole civilised world. The marvellous cheapness of the fertiliser, costing the department only 2d per packet for three packets sufficient to fertilise from 1 to 4 acres, is only equalled by its compactness and portability. The packages, containing sufficient of the fertiliser for an area of 6 or 7 acres, may be carried in the waistcoat pocket.

"Did you vaccinate your land this year?" was the startling question I heard one farmer ask another the other day. "Well, I guess," he replied. "You remember that corner field which I gave up as hopeless last year? Well, when I heard about the yeast cakes the Government was giving free with the promise that they'd make clover or alfalfa grow where we farmers couldn't raise anything but weeds, and thin weeds at that, I thoaght I'd send for several of the cakes. When the cakes came I vaccinated the field according to instructions, planting it in alfalfa. I tell you I've had three whopping crops, and I've got off that formerly worthless field five times more than I've been getting off my best land, and I've got some pretty good land, too."

We have grown accustomed to the idea of being vaccinated. Some of our most dread diseases have been vanquished or checked by inoculation—smallpox, diphtheriea, rabies, and, we hope, the plague—but to cure sterile ground and make it bring forth fruit in abundance by inoculation is something so strange and revolutionary that we should not believe the statement were it not for convincing and irrefutable facts.

Before explaining the discovery and manner of this extraordinary process of agricultural science, it might be well to review a few well-known facts in the life of plants.

IMPORTANCE OF NITROGEN.

One of the most important elements of the food of a plant is nitrogen, which it absorbs from the soil mainly through its roots; successive crops of grain soon drain the soil of its plant food, and in process of time make the richest land poor and worthless.

A good farmer partly balances the drain on his soil by using plentiful quantities of manure and fertiliser, and thus puts back much of the nitrogen which his crops remove.

We send to Chili, thousands of miles away, for help, and at much expense import from her thousands of tons of costly nitrate, though we have all about us—in the air we breathe—exhaustless stores of fertiliser. Free nitrogen forms seven-tenths of the atmosphere. If we could tap and use this sea of nitrogen we could fertilise the whole earth and keep it rich; but it has been of no use to us hitherto because we have had no means of capturing it and of putting it into the ground. Its simplicity has baffled us. Like the plenty that tormented Tantalus, it has ever eluded our grasp.

A NITROGEN FAMINE.

We are taking the nitrogen from the soil so much faster than we can put it back that some persons have predicted a "nitrogen famine" at no distant date, and have luridly described the horrors that will fall upon us when the soil becomes so poverty-stricken that our crops of wheat and grain and rice will fail to feed the nations. While this view is, of course, partly imaginative and exaggerates the nearness of the danger, the fact remains that many areas in England and Europe and the Eastern United States, formerly fertile, are now unproductive because the nitrogen in the soil has been exhausted.

But now man has captured a tiny germ invisible to the naked eye, which can take from the boundless stores of nitrogen he has coveted, and put it into the earth for him.

Ever since the time of Pliny, farmers have noticed that, after a crop of peas, alfalfa, or any of the leguminous plants, a heavier yield of wheat can be obtained; thus has arisen the old profitable rule of rotation of crops.

But the reason why certain plants enrich the ground while others exhaust it remained a mystery until an enquiring German discovered some years ago that peas, beans, etc., obtained their nitrogen food not from the nitrates in the soil, but from the free supply in the air. He also discovered that these plants absorbed much more nitrogen than they could use, and left the surplus in the soil—that is, beans, peas, alfalfa, clover put back into the mother earth what corn and wheat and grains remove. The manner in which they do this is unique, and another instance of the marvellous and mysterious laws by which the balance of nature is maintained.

THE BACTERIA NODULES.

If one digs up a healthy bean or clover plant and examines the roots, he will see a number of rounded bulbs, called nodules or tubercles, on the roots. At first sight he might imagine that the plant had a lot of sores over it, that it was diseased, or had been bitten by worms or insects. All legumes have these nodules or tubercles, varying in size from a pinhead to clusters as large as a good-sized potato. Scientists noticed that plants with good-sized nodules flourished, while plants without nodules or with very small ones looked starved and withered, and they concluded that the nodules must have something to do with the vigor of the plants. On dissecting a bulb and examining under a microscope, it was found to be packed with bacteria. Further examination showed that it and all nodules consisted of millions of bacteria, and that these bacteria were incessantly absorbing free nitrogen from the air and converting it into forms suitable for the plant's digestion.

NITROGEN-FIXING BACTERIA.

For want of a better term, we will call the germs nitrogen-fixing bacteria.

Careful examination of the earth showed that all soils where these legumes grow contain these nitrogen-fixing bacteria in greater or less quantities; that these organisms settle on the plants and form the colonies or tubercles on the roots. If the soil contains none of these organisms to settle on the roots, the legumes will not grow at all. Each tubercle acts as a feeder to the plant. The more numerous and larger the tubercles the more prosperous is the plant. One might thus define a tubercle as a little factory where millions of tireless, infinitesimal workers are separating the nitrogen in the air and converting it into plant food. A celebrated German, Professor Nobbe, of Tharandt, realised that if he could put into barren ground some of these organisms, or if he could artificially present the seeds with power to develop tubercles of themselves, he could make legumes grow in the most hopeless soil.

THE FAILURE OF NITRAGIN.

After much labor, he isolated the nitrogen-fixing bacteria. He succeeded in breeding and colonising the germs, and then proceeded to put them on the market. advertised them widely as able to make legumes grow in the poorest soil. Naturally the announcement made a great sensation, and farmers from all quarters of the globe wrote him for sample bacteria. He sold different preparations for different crops, putting them up in bottles and calling them Nitragin. But the bacteria did not work the miracles promised. Seeds inoculated with them failed to develop tubercles. A few persons, to be sure, obtained wonderful results, but the vast majority of cases were complete failures The bacteria burned themselves out and disappeared without producing a single nodule on the plants. They lacked permanence. The nitragin was withdrawn from the market.

These two men had done a great service to mankind: one had solved the problem of why certain plants enriched instead of drained the soil—he had isolated the microscopic agents, the myriads of organisms which carry back to mother earth what others had stolen; the other had shown that man could breed as many of these little helpers as he desired, but he had not been able to give them permanence, so that man could get service from them At this point the inventive genius of an American, Dr. George T. Moore, came to the rescue, and saved the discovery by giving it just the practical value it had lacked. Dr. Moore is in charge of the Laboratory of Plant Physiology of the Department of Agriculture, and a widely known practical botanist. He had been watching Dr. Nobbe's experiments, and had come to the conclusion that Dr. Nobbe did not cultivate his nitrogen-fixing bacteria in the right way. The German's method of rearing his germ colonies resembled that of a rich father who gives his son everything he asks for without making the boy work for anything. As a result, when the youth is thrown on his own resources he proves unable to earn his own living, and collapses. Similarly, Dr. Nobbe, instead of developing the natural inclination and ability of his bacteria to hunt out nitrogen for themselves, dulled and destroyed this ability by giving them large quantities of nitrogen food, in what we might call predigested form; he so satiated them with nitrogen that they lost their ability to hunt for it themselves, and when turned out of the laboratory were helpless. They soon consumed the store of nitrogen which they had received, but could not by themselves get any more. Their nitrogen-fixing ability was gone, and they perished.

Dr. Moore decided not to dull the appetite of the nitrogen-fixing bacteria by giving them all the nitrogen they wanted; he thought he would whet their appetite—would strengthen their nitrogen-fixing power, by exercise, by giving them in their food just enough nitrogen to make them want more and to make them strive to get more by their own efforts. By following this principle of feeding he developed a permanent type of bacteria in his laboratory, possessing five or ten times more power to fix nitrogen than the original germs had possessed. The bacteria had gained strength, vigor, and self-reliance, and, when turned out of the laboratory, prospered like all healthy bacteria. Legumes inoculated with the bacteria developed great tubercles and grew to great size even in the poorest soil.

The nitrogen-fixing power of the bacteria developed by Dr. Moore is so extraordinary that seeds soaked in the solution will sprout and produce luxurious plants in quartz sand which has been previously ignited to a red heat in order to drive out all nitrates.

DISTRIBUTING MEDIUMS FOR THE BACTERIA.

Having secured a type of bacteria the nitrogen-fixing power of which was permanent, the next step was to obtain a simple means of distributing them to persons who desired to inoculate their land. Experiments showed that bacteria when grown upon nitrogen-free media will retain their high activity for a long time if carefully dried out and revived in a liquid medium. Dr. Moore also discovered that by using some absorbent, like cotton, a small piece of which will soak up millions of the organisms, and then by allowing these cultures to become dry, the bacteria can be sent to any part of the world and yet arrive in perfect condition.

Naturally Dr. Moore patented his discovery, but then he did a very unusual thing—he deeded the patent to the Department of Agriculture in trust for the American people. To be sure, his discovery had been made in the Government laboratories, but the Government, neither morally nor legally, could claim any share in the discovery. It was indubitably his. Dr. Moore gave the patent to the people, in order that all might have the free use of it. Doubtless he could have made a generous fortune if he had formed a company and exploited the patent, as the German company made a good profit from their unreliable nitragin, which they sold at a dollar a bottle. A simple method of distributing the germs that bring fertility having thus been found, the announcement was made that the Department of Agriculture was prepared to send applicants free of charge enough inoculating material for several acres.

A portion of inoculating material as it is mailed to the farmer by the Government consists of three different packages. Package No. 2 contains the cotton with its millions of dried germs. Packages 1 and 3 are the media or food by means of which the farmer can multiply the germs. The department incloses explicit instructions how to use the bacteria as follows:—

DIRECTIONS FOR USING INOCULATING MATERIAL.

(Method patented in order to guarantee the privilege of use by the public. Letters Patent No. 755519, granted 22nd March, 1904.)

Put 1 gallon of clean water (preferably rainwater) in a clean tub or bucket, and add No. 1 of the enclosed package of salts (containing granulated sugar, potassium phosphate, and magnesium sulphate). Stir occasionally until all is dissolved.

Carefully open package No. 2 (containing bacteria), and drop the enclosed cotton into solution. Cover the tub with a paper to protect from dust, and set aside in a warm place for 24 hours. Do not heat the solution or you will kill the bacteria—it should never be warmer than blood heat.

After 24 hours add the contents of package No. 3 (containing ammonium phosphate). Within 20 hours more the solution will have a cloudy appearance, and is ready for use.

To Inoculate Seed.—Take just enough of the solution to thoroughly moisten the seed. Stir thoroughly so that all the seeds are touched by the solution. Spread out the seeds in a shady place until they are perfectly dry, and plant at the usual time just as you would untreated seed. The dry cultures as sent from the laboratory will keep for several months. Do not prepare the liquid culture more than two or three days previous to the time when the seeds are to be treated, as the solution once made up must usually be used at the end of 48 hours.

To Inoculate Soil.—Take enough dry earth so that the solution will merely moisten it. Mix thorougly, so that all the particles of soil are moistened. Thoroughly mix this earth with four or five times as much, say half a wagon load. Spread this inoculated soil thinly and evenly over the field exactly as if spreading fertiliser. This should be done just before ploughing, or else the inoculated soil should be harrowed in immediately.

Either of the above methods may be used as may be most convenient.

Enough germs are sent in each little package to inoculate seeds for from 1 to 4 acres. The package can be carried in your pocket, and yet does more work than several cartloads of fertiliser. It costs the Government less than 4 cents a cake, or less than a cent an acre, and saves the farmer 30 or 40 dollars, which he would have to spend for an equal amount of fertiliser. Different cultures are sent for different crops.

STARTLING RESULTS.

The results have been surprising. If Malthus were living he would have to revise his calculation of the time when the world will be so crammed with people that it cannot feed them.

Very startling is a comparison of the actual figures of yield of two crops grown on exactly the same land, but one of inoculated and the other of uninoculated seeds. Two patches of hairy vetch, grown side by side under precisely the same conditions, yielded crops as follows:—Uninoculated patch, 581 lb.; inoculated patch, 4,501 lb.—an increase of more than eight times. Crimson clover under similar conditions yielded—Uninoculated, 372 lb.; inoculated, 6,292 lb.—an increase of nearly twenty times.

THE BACTERIA EASILY APPLIED

It does not require a trained scientist to apply the cultures. The results obtained by any intelligent farmer are as wonderful as these.

A Maryland farmer had formerly been able to cultivate only one-third of his land; he had been obliged to abandon two-thirds because of the hopelessness of getting anything from it. Now, at no expense to himself and at trivial amount of labor, he had reclaimed the worthless two-thirds and made it more productive than the other third. He had increased the yield of his farm, his income, fivefold; a generous living is now before him.

And what did it cost the Government to help him so generously? Eight cents! The farmer had used two cakes to inoculate the seeds for 7 acres, each cake costing the Government 4 cents to manufacture.

But there are even other wonders that these little nitrogen-fixing bacteria work. It has already been explained how legumes enrich the soil by bringing back nitrogen to it. The same bacteria that increase the harvest of beans or clover or alfalfa tenfold enable the plants to leave many times more nitrogen in the soil than they would have done if uninoculated; in other words, they make the soil many times more fertile, so that the crop of cotton or wheat or corn or potatoes planted next year is many times larger. Thus the rotating crop the year following inoculation derives an equal benefit from the inoculation. For instance, a crop of crimson clover, not inoculated, added to 1 acre of land 4·3 lb. of nitrogen; a crop of crimson clover, inoculated, added to 1 acre of precisely similar land 143·7 lb. of nitrogen, an increase of 33⅓ times; a crop of inoculated hairy vetch added to 1 acre fifteen times more nitrogen than a crop of uninoculated hairy vetch.

Cotton planted after an inoculated crop of red clover gave an increased yield of 40 per cent. Potatoes, after an inoculated crop, yielded an increase of 50 per cent. The wheat crop increased by 46 per cent., the oats 300 per cent., and the rye 400 per cent. The table below shows the effect of inoculated legumes on various crops.

The germs can be used in any climate. It must be clearly understood, however, that only leguminous plants—beans, clover, alfalfa, peas, lupin vetch, &c., are directly benefited by the nitrogen-fixing bacteria. Where the soil is rich in nitrates, the crop is not appreciably increased by the use of the inoculating bacteria; but where the soil is poor, the harvest is increased many times.

There is not a section of the United States which will not profit by Dr. Moore's discovery. Nearly every State has its worn-out farming land, bringing despair to the economist who laments our careless handling of the fields, and who wonders how the country will support the hundreds of millions soon to be ours. The bacteria means cultivation with a vengeance, and should give him hope. It is impossible as yet to calculate by how much they will enhance the yield of our crops, and of the world's crops, but the results already achieved prove that in time the gain will be enormous.

	Original Yield per Acre.	Yield per Acre after Inoculated Crop.	Gain in Weight.	Gain in Value.	Per Cent. of Gain
	Lb.		Lb.	$ c.	
Cotton ..	932	After red clover, 1,304 lb.	372	44·64	40
	Bushels.		Bushels.		
Potatoes	67·8	After crimson clover, 102·2. bushels.	34·5	15	50
Oats ..	8·4	After velvet beans, 33·6 bushels.	25·2	9	300
Rye ..	4·5	After peas, 23·5 bushels.	19	9·85	400
Wheat ..	18·6	After. melilotus; 23·9 bushels.	8·3	6·50	46

OPERATIONS FOR MARCH.

By W. J. Allen.

The latter part of this month will find the fruit-grower congratulating himself on the fact that the rush of his summer work is just about over, the stone fruits, with but few exceptions, having been marketed, and in many districts the apples and pears also. In the cooler districts there may be some growers who are holding such fruits, but, generally speaking, the growers of good fruits find a ready sale for same as soon as they are in a marketable condition, and they are sent to market as soon as they are ready. Some of those who hold the fruit for a time simply pick it, put it in cases, and allow it to remain under the tree and in the shade; the boxes are then covered up and exposed to all kinds of weather, yet notwithstanding this apparently rough treatment I have seen apples kept in perfect condition for some months in this way.

There are many plans for building storerooms for apples; the following description, taken from Wickson, being that of a room built by Mr. Edward Berwick, of Monterey, one of the leading apple growers of the coast region in Southern California:—"The apples are carefully hand-picked into baskets, and at once transferred to ordinary apple boxes—just put in loose, not packed tight as for shipping. These boxes are hauled to the fruit-house with as little jar as possible. This fruit-house is built of rough boards (fastened on a heavy frame), with inch-thick battens, thus leaving an inch air-space between the boards and the rustic. It is of two stories, the upper devoted to tools and stores, the lower used for fruit, and arranged with shelves accordingly. This lower story has only an earthen floor. One object of this is to give no lodgment for rats or mice; the other is to serve as a means of maintaining a cool, damp atmosphere. To this end it is kept well watered in apple-keeping season; and to avoid mildew or mould it is also liberally sprinkled with ground sulphur. By day, doors and windows are mostly kept shut, by night open; this, of course, is to exclude the heat and allow free circulation of the cool night air."

Of course one does not expect to keep autumn apples for any great length of time, more particularly those grown in our warmer districts, but in the cool, mountainous country, even these may be kept back a little time, while the better varieties of winter apples may be kept for some months.

In visiting the different apple-growing centres, I find that the great majority of the growers are in favor of a Pests Bill, as it is claimed that without united action there is but little hope of their ever keeping in check the remorseless foe of the apple-grower—the codlin moth—because while many of the growers may be using every known means of keeping it down, there are always those who give their trees but little attention, but are most successful in breeding good crops of the moth, which in their turn relieve these indolent growers from the worry of marketing large crops, the fruit, such as it is, being naturally of a quality on a par with the quantity. It is such growers who help to keep the careful, industrious man back.

So far as the scale diseases are concerned, we know that by fumigating or systematic spraying, these can be kept in check by individual growers, but the codlin moth can only be kept within reasonable bounds by united action on the part of all the growers of apples, pears, and quinces. The question is, will they work together with the object of defeating the yearly ravages caused by this pest?

Wherever the citrus trees are found to be covered with red and other scales no time should be lost in fumigating them. If the grower has no tents, but on the other hand has a spray pump, he should spray at once with either the resin, soda and fish oil, or the blue oil emulsions, recipes for mixing which have been given in previous issues.

The French Prunes and Gordo Blanco or raisin grapes will be ripe enough to pick, and in the case of the latter where they are to be dipped the same strength of lye may be used as for the prunes—that is 1 lb. of caustic soda to 8 or 10 gallons of water, just on the boil; the fruit should be allowed to remain in this for about two seconds, when, if the lye is sufficiently strong, the skins will be found to be slightly cracked. If cracked too much the appearance of the fruit is spoilt. The fruit should never be permitted to become too dry before removing from the tray to the sweat box. In the case of prunes they should be immersed in boiling water, or steamed in a retort for at least five minutes before packing; this last dip is best done on a hot day.

There is one very important work which fruit-growers should not fail to do every year, and that is to take careful note of how the trees, fruits, and vines have succeeded under their system of cultivation and pruning. If too much wood has been left the chances are that the size and quality of the fruit has suffered in consequence. It may be that the fruit on trees or vines showed no signs of ill effect from the over cropping until about a month or so before ripening, when instead of developing and maturing as it should, it stopped growing and gradually ripened without attaining a proper size.

This is a very important matter which growers should keep constantly in view, and at no time during the year can the results of different methods of pruning be seen so well as when the fruit is ripening, when each variety should be closely watched and such notes taken thereon as will serve as a guide for the following year's pruning. It is always well to bear in mind that trees or vines must not be overloaded if they are expected to produce regular crops of high standard fruits, which quality alone will always command the highest prices on the market, and repay the grower best while taking the least out of the trees or vines.

Those who are the most successful in fruit-growing have found that they have had to combine a thorough system of cultivation with proper pruning and judicious manuring to attain these results. There is a time when each of these several branches of the work should be done, and by neglecting to properly attend to any one of them certain loss to the grower will inevitably follow.

Codlin moth should still be watched most carefully, and all grubs killed which have found shelter in the bandages; also all fallen fruits should be picked up and destroyed.

Winter crops intended for green manuring the orchard should be put in this month, so that they will be well grown and ready to plough under in the early spring before the dry weather sets in.

Those who intend planting more fruit trees this coming winter should not be late in preparing the soil and putting it in a fit condition to receive the young trees.

Budding young nursery stock may still be carried on during the early part of this month.—"Agricultural Gazette of N S.W."

The manuring of orchards is a subject which has not received the attention that its importance demands. Trees cannot go on for all time bearing heavy crops of fruit without the soil becoming exhausted, and the older our orchards grow the more necessary does it become that the best methods of prolonging and increasing the productiveness of the trees should be carried out, which can best be done by applying artificial or stable manure.

Green manuring is also practised with good results by many of our leading orchardists. Plough the ground as soon as possible after the fruit has all been gathered in, and sow with dun peas at the rate of two bushels per acre. Apply 1 cwt. of superphosphate with the peas, this will give them a good start and will also greatly benefit the trees. In spring time, about the early part of September, the peas will be fit to plough in. First roll them with a heavy roller the way the plough runs, also fit the plough with a revolving coulter when the peas can be turned in without much trouble. Before ploughing the peas in, 2 cwt. of superphosphate and 3 cwt. of muriate of potash per acre should be applied. This forms a very complete manure, the peas supplying the nitrogen and humus, the superphosphate the phosphoric acid, and with the potash the trees will be furnished with all that they require. Farmyard manure should also be applied where sufficient quantity is available. A good dressing of virgin soil, wood ashes, or any kind of litter is of great advantage where it can be obtained.

In gathering apples and pears for export, it is advisable to gather them in the early morning when the fruit is cool. Advantage can always be taken of changes in the weather to select a cool morning to gather the fruit; on no account should fruit be gathered on a hot afternoon, as the fruit then never thoroughly cools down before being packed. Fruit packed in a heated state never carries well, and is generally landed in bad order.

There is a good deal to be said in favor of putting the fruit in a cool chamber before being packed, but so far it has not carried well, owing to being placed in the ship's cool chamber with uncooled fruit. Where the whole of the fruit in the ship's cool chamber has been treated in this way it is very satisfactory, but as in the case of our mailboats, the great bulk of the fruit in the cool chamber is from Tasmania, which has been packed in the orchard, and is, therefore, of much higher temperature, the case is different. This is because the cold air is driven in at a very low temperature in order to cool the bulk of the fruit, consequently the cooled fruit placed in the same chamber suffers, and is never landed in such good condition as the uncooled portion of the cargo. The remedy lies in the whole of the fruit intended for the one chamber being cooled down to the same temperature before being placed on board.

During the past two or three years some of our shippers have had their consignments cooled prior to shipment, but these consignments have not turned out in such good condition as was expected, and, according to the sale catalogues, only realised moderate prices —James Lang, "Agricultural Gazette of Victoria"

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The Flower Garden

OPERATIONS FOR APRIL.

Sow seeds of hardy annuals, of perennials, and biennials as soon in the month as possible, or it will be rather late to raise annual seedlings for planting out for early spring flowering. Spring flowering bulbs, such as daffodils, Watsonias, hyacinths, sparixis, tulips, anemones, crocuses, and others, should be planted without delay.

Cuttings of roses, pelargoniums, verbenas, fuchsias, carnations, petunias, and other similar plants should strike well if set in carefully prepared beds during the month. But they will need looking after, watering, and shading if necessary. If just stuck in the soil and left to themselves they will probably fail.

Every one in the country who reads these directions should endeavor to grow and protect a few flowering plants, or some shrubs, or a few trees somewhere about the house and other buildings, and make the place cheerful with a few flowers here and there. Occasionally in the country may be seen the most beautiful flowers and plants, vegetables, and fruits, tended with every care, even though the home may be small and humble enough. But, unfortunately, as a rule, the barest and most uncomfortable-looking dwellings and dismal surroundings are in evidence.

THE HARDY FLOWER GARDEN.

During April a great deal of work of a preparatory kind must be taken in hand in order to keep the garden attractive during winter and the following spring and summer. Additional soil and manure is given to all low and impoverished sites which are vacant or but sparsely planted; sundry shrubs and hardy perennials will stand cutting into neat and varied form and size, and the dead stalks and flower spikes of annuals and herbaceous plants call for removal. Stakes, too, which support nothing, should be cleared off, as nothing makes a garden look poorer than a lot of dead and undecorated wood. More sunlight and heat may reach the soil than in the preceding months, that it may be kept warm and sweet, and so maintain the beauty of flowers and foliage, as well as ripen all necessary wood.

Cuttings of many soft-wooded things may be taken now, as, if placed in a warm, sweet soil they will root quickly, and become hard and sturdy enough to tide over the winter. Autumn cuttings require to be of harder wood than those selected for spring rooting. This is owing to hard wood having more substance and less water, features which allow it to grow in the face of a falling temperature. Soft, sappy shoots rot in such circumstances, whilst the rising heat and dryer soil and air of spring rob them sufficiently to make rooting easy and sure. Select wood of good average size, which has borne strong and ripened leaves. The closer the joints the better. Leaves are not equally necessary to all cuttings, so much depends on the temperature and degree of moisture in the soil and atmosphere. The first necessity is to cause the sap to congeal and form a callus at the base end in the soil. Strong leaves pump up the sap and exhaust it, thereby reducing the callus and root-making power at the base. Little water is needed in the cuttings, but the active properties of the sap must be allowed to go to the making of roots before much or any head growth is made in the form of leaves. On the other hand, some very soft wooded plants root more freely when a small amount of leafage is left to the cuttings. The leaves growing steadily or already fully grown do not take as much as they give in the shape of elaborated and root-forming sap. It may be seen that fully grown and mature leaves will not exhaust the substance of a cutting, but rather tend to strengthen it, where young and growing leaves are a weakening influence. Good gardeners regularly take off the prominent eyes as well as the leaves from some cuttings, in order to lock up the sape and secure the formation of roots.

SOWING HERBACEOUS PERENNIAL SEEDS.

One of the greatest dangers to be avoided in sowing fine seed is covering them too deep. It is better not to cover at all than run the risk of covering too much. Something in the shape of a flour sifter will be found extremely useful where any quantity of seed is to be sown. A safe rule to go by is to cover the finer seeds about their own depth.

Seeds vary considerably in the time it takes them to germinate. New seed will come up much more promptly than old seed of the same kind. The following list will give an idea of the varying periods required for the different kinds to germinate, sown under favorable conditions, the approximate number of days being given in each instance: Anthemis campaniana, 2; A. Kelwayi, 4; Alyssum saxatile compactum, 9; Aquilegia cœrulea, 20; A. flabellata nana alba, 20; A. vulgaris fl. pl., 20; Armeria plantaginea; 9, Asclepias tuberosa, 11; Bellis perennis, 3; Campanula carpatica, 12; C. carpatica alba, 12; C. grandis, 9; C. media, 12; C. persicifolia, 14; C. persicifolia Moorheimi, 9; Centaurea montana, 9; Centaurea dealbata, 9; Chelone barbata, 12; Delphinium formosum, 9; Delphinium chinense, 11; Digitalis grandiflora, 14; Gypsophila paniculata, 6; Gnaphalium leontopodium, 12; Heuchera brizoides, 20; Heliopsis Pitcheriana, 9; Lychnic flos-cuculi, 9; Papaver orientale, 9; Platycodon Mariesii, 14; Scabiosa caucasica, 13; Lychnis viscaria splendens, 8; Iberis sempervirens, 8; Lupinus polyphyllus, 8; Statice latifolia, 20; Digitalis Purpurea, 12; Gaillardia grandiflora, 8.

After the seed germinates there follows a period varying from two to three weeks before the seedlings are ready to handle. As a general rule, it will be found that the sooner this can be done the better.

It is customary to wait until the character leaf is developed; but this is not at all necessary. If the seedlings show a tendency to damp off, pricking off will very likely save them, even though they are only in a cotyledonous state. After the seedlings have been pricked off, their growth is usually very rapid, and they will soon be ready to put into two and three-inch pots, preparatory to going outside.

Ernest Hemming.

LANDSCAPE GARDENING.

By J. Woodward Manning.

Many gardeners feel that their duties are altogether too varied now, and their present efforts are not sufficiently appreciated as it is. It cannot be denied that this may be so; but may this not be due to yourself, largely? This may or may not be possible according to opportunities; do you make the most of such whenever they occur? Is not your greatest opportunity in so broadening your knowledge and applying it that your worth may have greater recognition? If your duties are so numerous and varied that gardening must of necessity be a minor matter, you may still broaden your knowledge as far as possible; but look to it that as soon as may be you obtain a situation elsewhere that your gardening propensities may be better appreciated and encouraged. The broadening public interest in gardening that is being produced by the numerous horticultural books and papers, now existing or promised, is but a forerunner of what is to follow.

Don't fall into the common error of following a rut of work, planting only what you have planted in the past, repeating the same treatment in the most perfunctory manner. Don't feel that you should necessarily be directed by the owner without taking the initiative when opportunity presents; this may be unavoidable, perhaps the fault is yours.

The solving of the problem of opportunity I consider of the highest importance for the gardener in showing his worth, and this problem is that fundamental basis of landscape gardening that I am advising you to practise where you study to make the most of what you have to work with rather than to follow the lead of some rival, particularly when conditions may be so different as to make such an attempt ludicrous. First study the place as a whole and convince yourself at the outset as to what the limitations must be. The natural conditions ought to solve the problem largely; if bare open area, then you must produce the future picture; if possessing rugged or picturesque features, arrive at an early decision as to whether such conditions are not the forerunner of the policy you ought to pursue; and if so, use every precaution to preserve what nature may be abundantly supplying. An old tree may be favorably placed to give emphasis to a view; the study of how to add a bit of planting to aid the effect and complete the picture or to improve by a little judicious thinning with due regard to the preservation of the best will be interesting. Perhaps you can save an outcropping ledge that might ordinarily be considered an encumbrance when it may be the opportunity to form an interesting feature of itself; or, with proper planting form the nucleus of something of harmonious interest. The use of the greatest discretion in clearing underbrush in a bit of woods, with a careful discernment as to whether the native growth does not of itself have ornamental value in better harmony and attractiveness than could be produced artificially; even a mass of clinging poison ivy clambering over a sturdy tree trunk may perhaps be preserved, provided you supply planting at the base of an impenetrable nature to preclude any danger.

Recognise and study the value of our common native plants, our ferns, native roses, our own wild asters and columbines, with hazels and many other that the landscape architect has had sufficient discernment to take advantage of. Many of these plants are adapted to shady or sterile situations where effort to establish exotic plants would be disappointing. This by no means, however, precludes the use of the exotics therever their proper place may be. You can get lots of good points from nature on the grouping and combination of plants that will work to advantage under varied conditions.

Carefully study the adaptability of plants; don't place rhododendron and azalea beds in sunny unprotected, dry situations, where annual expense will be required to provide the needed protection artificially, and which can only partially produc the desired results and eventually discourage your employer in such expenses.

FERNS AS BEDDING PLANTS.

When we talk about bedding plants, we generally have in view those which will produce a mass of color in the summer. Too often, I am afraid, we succeed in obtaining so much color that our eyes ache with looking at it.

Masses of different colors which are so arranged that they harmonise, do not offend the eye so much, but of late years the tendency has been to judiciously mix foliage and flowering plants, and a good combination of the two has the best effect of all.

But there are places in many gardens where flowering and foliage plants will not thrive satisfactorily. Such positions are those overshadowed by tall trees or buildings; and these are the very spots for planting ferns; not in rockeries, a plant here and another there, but a bed of them.

In the hot days of summer it is restful to gaze upon luxuriant ferns; and, besides being in themselves pleasing, they add to the beauty of a whole garden, setting off, as it were, the borders occupied by flowering plants.

The soil will, in most cases, need a special preparation. If it is not light loam or sandy, some of the original soil must be taken out and a mixture of sand, peat, and leaf soil put in its place. Where peat is used, make the compost fairly firm before planting is done.

It would be better to try one bed first and do it well than fill several badly. Put out plants from pots principally; hardy sorts should be selected for this purpose.

I will here give one example of a fern bed —a round one. In the ctntre plant the Royal Fern, Osmunda regalis, one or more plants according to the size of the bed. Next, three plants of Woodwardia angustifolia; then clumps of Onoclea sensibilis between the Woodwardias, but also projecting unevenly towards the outer edge of the bed. Near the edge plant clumps of Scolopendrium vulgare, with a finishing band of Athyrium Filix-femina, the Lady

Fern; or the common Polypodium vulgare may be substituted.

The above named sorts are best for a somewhat large bed; fewer of the large growing species should be planted in small borders.

A long, narrow border facing the north, whereon the sun rarely shines, is a capital one for a ribbon border of ferns; the large ones should be planted at the back and the dwarf ones in the front.

For several weeks at least after the plants are put out water must be given very carefully. When once the soil is thoroughly moistened through it should be kept so, but not saturated; evening syringings are very beneficial.

SOLENT.

AN ENTHUSIASTIC ROSARIAN.

It might be said with truth that everybody likes roses, and there is no other flower that has more admirers. The same remarks probably cannot be applied to any other flower amongst English-speaking people. While it is exceedingly interesting to walk through a garden with admirers of the Queen of Flowers, it is a positive charm to be escorted by one who knows his roses like a book, and never tires of extolling their beauties. Such a one our representative met in Dr. J. A. G. Hamilton, who showed him some of the finest blooms to be seen anywhere. The doctor's residence in Jeffcott-street, North Adelaide, is built upon the usual size of a building allotment, and being a house of considerable proportions, with the front close to the street, the casual passer-by would never suspect that any portion of the ground could be devoted to a garden of any proportions. But it is often under such disadvantageous circumstances that one finds some of the rarest beauties raised under an affectionate care. Indeed, it is only the love of the beautiful that overcomes difficulties that are insuperable to the common variety of amateur gardener. The man who has a hundred and one excuses for a shabby garden may rest his soul in peace that he will never have a flower worth looking at, but the true lover of flowers will always have them, no matter what difficulties may appear.

At the side of Dr. Hamilton's house is a strip of land less than 20 ft. wide. A huge pepper-tree takes up a good proportion of the street end. This gives a grateful shade in summer, and makes a fine breakwind, but the doctor is jealous of the room it takes out of his limited space. A buffalo lawn is planted the full length of the ground to a dividing fence from the back portion of the garden. Although about half of the lawn was replanted early in December last, it looks very well, and one could hardly tell the new from the old portion. In this lawn are four circular flower beds, each containing a favorite Rose. No. 1 contains a Triumphe de Pierre, No. 2 Madame Lourette Messiny, No. 3 La France, and No. 4 The Bride. These are all full standards, with large bushy heads, through having been lightly pruned. They are, however, fine specimens, and the blooms were exceedingly good from bud to blossom. The beds also contain a setting of choice Pelargoniums, dwarf Coxcombs, and Coleus. The latter are particularly good, and demonstrate that these plants do as well in the open bed as in the shadehouse.

The doctor's neighbor is divided off by a high latticed fence, and upon this are grown a number of climbing Roses, all of the best, in the veterans William Allan Richardson, Cloth of Gold, Crimson, Rambler, La Reine Marie Henriette, Perle de Jardine, Waltham Climber, Fanny Stolwerch, Ard Pillar, and Purity. At the end of the fence is a shadehouse on the neighbor's side, and this is covered by a wonderful two-year-old growth of Cloth of Gold. No ground can be spared to waste, and along this fence, in addition to the roses, the lawn is cut back to allow bedding for Zinnias, Phlox, Coxcombs, Carnations, Petunias, and Asters. Being all summer bloomers, the green lawn has no lack of coloring for a ground setting. At the end of the lawn is a bed of self-sown Balsams, and nothing could be finer. Up to about 2 ft. high their rank growth is covered with bloom, from the richest prime coloring to the daintiest shades. Some of the largest double blooms are charming rivals to small Roses. In this bed also is the ever delightful White Maman Cochet, and Mad. Lambard. It is an accepted dogma amongst rose-growers that the royal Queen of Flowers is so exclusive in her exalted dignity that she is fretted with indignation and will not thrive to bloom if "plebs" are forced into her company. Here we have, however, an illustration of two royal queens throwing off their dignity and blooming profusely while their court is covered with a mass of Balsams growing with the strongest vigor.

Crossing the footpath alongside the house the doctor has cribbed a few feet of the back yard, which, viewed through a high lattice, is none too spacious, and here we find Perennial Phloxes looking splendid, Portulacas, Violet, Dianthus, Perennial Sunflowers, Zinnias, Coreopsis, and Delphiniums, all crowded, but all in bloom, and making a gay setting to a huge Rose tree of Mad. Berrard, in company with La France, and, to give the bed a tone of choice up-to-date standing, we note a last year's "novelty" in Lady Roberts. In spite of her crowded surroundings, Lady Roberts is doing well, but would probably show to better advantage with a little more breathing space.

Turning now, we enter the back garden, and herein can be no offence, because the back garden is quite equal to the front. This, divided by a high growth of climbing roses, with an archway for entrance. This dividing fence, if a mass of loveliness can be called such, is a perfect shrine of beauty when in full bloom, as may be imagined when we name such choice colorings as are given by the Duchess of Ostard, Rev. C. T. Cole, Meteor, Devoniensis, Gustave Regis, and Souv. de Watton. In that lot the eye wanders, never wearying of the charming tints, and fancy curving of petals from bud to bloom. And the perfume, too, so delicate and refreshing that the most sensitive olfactory nerve will plead for more. Will creation ever present another such thing of beauty and fascination as the Rose. Surely, never. As we pass under this bower of beauty another high fence to the right shelters the garden from the southwest winds. This fence is covered the whole length with the beautiful red La France, the sweet-scented Pink Rover, Lorraine Marie Henriette, Fortunatus, and Marechal Niel, and so completely covers the fence with strong woody growth, nice foliage and beautiful blooms that one wonders why people are at any tme at a loss to know what to plant on fences.

This little plot of ground is divided into three long beds, the whole area being anything up to 30 x 40 ft., as far as the eye could judge casually. On the eastern bed attention is first arrested by a deep edging of Balsams, one mass of bloom, vieing in beauty with the Roses. The double flowers, with their delicate tintings and sweet perfume, being highly favored. At the end of this plot the doctor has started a new line, to him, in Carnations. This now fashionable flower has a little square patch all to itself, and we noticed some choice labels, amongst them being such as Edith Grey, Piedmont, General Gordon, W. R. Deane, Ravenswood, and many others of the latest fashion. Passing a galvanised iron back to a shed we noticed it being rapidly covered by a Souv. de Joseph Metral, L'Ideal, and the commonly-known Fortune's Yellow. Not an inch of ground is to be wasted, and at the foot of the Roses is a bordering of Portulacas, with their bright blooms beaming in the sunshine. At the corner of the end footway is a little pigeon-house, embowered in a Billiard et Barr and James Wilson, and ever-blooming Plumbago Capensis, and a Linum of which we forget the name for the moment, but throwing some fine trusses of deep blue bloom.

The pathway between the centre and western beds is nicely bordered with variegated geranium, and the doctor affectionately handles the blooms of his favorite roses as he descants upon the colorings and forms of Rose Darien, Mad. Abel Chatenay, Jules Grolez, and two of which he does not know the name, but one which is uncommonly like Belle Siebrect, but evidently bearing another strain in the very deep golden centre, and the other of deep pinkish hue, described by a florist as Jeanne Guillaumez. The very brilliant red Gross en Tipletz has a soft corner in his heart, and none the less favored are Dr. Grill, Sunrise, Antoine Revoir, Shandon, the lovely buds of Germein, Ethel Brownlow, Pink Maman Cochet, the blooms of which he speaks of as being as big as your hat; Sunset, Mad. de Watteville, Frau Dubriel, Mrs. Edward Mawley, perhaps the finest rose in the collection; Lady Mary Fitzwilliam, a bloom which we thought it difficult to beat; Marquise Litta, and a remarkably fine bush of the ever-favorite Cecil Brunner.

In the side bed we noted the roses are accompanied by their confreres, the Carnations, and amongst the latter there were some of the best, including Aldgate Striped, Alma, and Richard Douglas. The roses were represented by such prizetakers as Muriel Grahame, Paul Neron, Beaute Inconstante, Catherin Guillot, Liberty (not doing well), and Killarney. There were also Souvenir de Pierre Notting, Safrano, Dr. Passet, Princess Alice de Monarco, a very fine doer; the great beauty Mildred Grant, and one of the late ones from America, Admiral Dewey.

With such a collection it is little wonder that Dr. Hamilton takes a great pride in "all his own growing," and we are pleased to be able to congratulate him upon being amongst the prizetakers at the last show in the Exhibition, where he had to beat several professional growers who had staged a very fine set of roses. His garden is quite an object lesson in what an amateur can produce with a comparatively limited amount of time and space. His ground, too, being upon a limestone subsoil close up to the surface is very good proof that roses with care are not so susceptible to the thrsty conditions of limestone as most gardeners seem to think.

ROSES AS RAMBLERS.

Many of the climbing roses could be set out to grow at will as bushes, with little or no attempt at pruning them. When so grown they form large clumps of great beauty. Last season some large clumps of the wild prairie rose, R. setigera, and of the Japanese, R. multiflora, grown in this way, were objects of great attraction when in flower. These and simlar climbing roses may be set out on banks, in a half wild state, and let ramble at will. Both the setigera and multiflora planted this way make a profuse display of flowers. Wichuraiana, known as the memorial rose, is often planted in like positions, but its habit of lying almost prostrate on the ground fits it for uses other than the half-wild one the others suit so well. The setigera and multiflora will, when the plants are strong, make shoots ten to twelve feet in length, and these shoots produce a mass of flowers the season following. Our landscape gardeners have found how useful these and similar roses are for massing purposes. The setigera is usually one of those planted both because of its beautiful single pink flowers and that it blooms later than the others.

A BEAUTIFUL HEDGE.

This is a long hedge, or series of hedges, formed of different flowering plants, one following the other along the whole stretch. White Sweet Peas, for example, may clothe a few yards, then orange Nasturtiums may appear also up neatly arranged Pea sticks, then Canary Creeper, then blue Convolvuluses, then pink Peas, white Bindweed, Lathyrus sativus, dark Nasturtiums, Tropeolum, pink Convolvuluses, carmine Peas, and Gourds. If a few lengths of the hedge are made of perennials, so much the better; we can use Jasmines, white and yellow, Pyrus Japonica, Calystegia pubescens, perennial Lathyrus latifolius, rose and white Clematises, Brier and other Roses, Ivies, Rubus fruticosus plenus, Honeysuckles, and even Ampelopsis. A favored spot will allow of a hedge of half-hardy subjects, among which Cobeas, purple and white, should not be forgotten. Passion Flowers, Mina lobata, Maurandyas, and Lophospermum scandens may be induced to flourish. A hedge made of nothing but different Ivies is very pretty, or, of course, the Ivies can be used to hide an ugly wall.

M. HAWTHORNE.

BURBANK'S FADELESS FLOWER FROM AUSTRALIA.

(From "The Florists' Exchange.")

When I heard that there was a new flower that was sure to hold its color, not to wilt or decay, the picture came before me of a flower on the poinsettia style. I pictured to myself, looking at the humorous side of it, say, a million homes in New England which would have, instead of the case of wax bloom, a million of "Burbank's fadeless," and these would be kept to show on special occasions. There would be no more object in producing flowers, for, with the everlasting flower in each home, there would be no desire to grow others; the people would all be supplied in a short time and the flower market killed. Rather a dismal outlook for the grower, but a bright one for those who are lovers of flowers, for, like the traditions of our New England families, would be the family flower, and on special occasions it would be brought forth to embellish the old New England parlor and the wax flowers in their case would sink into insignificance beside the beauty of the flower which never fades.

Fact and fiction sometimes go together, and so in this case. I have told you my impression of the flower which was based on sensational newspaper articles which were written without consent of Mr. Burbank, and by those who knew as much of flowers and their uses as a cow does of gunpowder and snipe shooting.

On January 26 I had the pleasure of a very interesting visit to the Burbank home at Santa Rosa, Cal., and from him personally I learned the truth concerning this interesting flower, and I am, with his consent, writing the facts as they really are in regard to it.

Cephalipterum Drummondi is the name of the plant, and so far as I know there is no common name. This rare plant was discovered in 1902 in North-Western Australia, and seeds of it were sent to Mr. Burbank from there. It has been grown by him and improved on, and is now producing flowers three times the size of the blooms produced by the original type. Thus we see that it was not an origination of Mr. Burbank's, and it is, therefore, a production of nature, and nature alone is responsible for the species. The seed which Mr. Burbank first received produced flowers about one-half inch in diameter, light pink in color, and borne in clusters on a stem some 8 in. in length. The foliage of th eplant is a light green, judging from the flower which Mr. Burbank presented me, and not heavy in texture. There are ten blooms and buds on this spike, and the flower has cleven petals in every instance. This specimen has now been picked over a year and a half, and, according to Mr. Burbank, it has its natural color to-day, and the form of the flower is the same to-day as when picked a year and a half ago. The bloom is not easily broken judging from its present condition, and the treatment it has received since it came into my possession.

By nature the plant is a half-hardy annual, and it will do best in a dry climate and with a dry soil. Environment has had a great deal to do with producing such a plant, but it seems to do well under conditions of greater moisture.

What the value of such a plant will be is a question which can only be answered when the plant has been grown more generally. Judging from what I have seen of it the chief value would lie in its being used as a border plant, or for use in bedding. The enormous quantity of blooms, and the fact that they retain color and form would make it such, if combined with rapidity of growth and strong qualities of germination of the seed.

Some seed of the original type of cephalipterum has been disseminated, but no seed of the improved type will be allowed to leave Mr. Burbank's place until 1907 or later, and not then unless he is satisfied that it is of value and has completed his work of improvement.

San Francisco papers have published sensational reports of this plant, and give a great deal of space to it from the standpoint of the milliner, representing that it will outclass the artificial flowers for millinery purposes, but how much of this is substantial remains to be proven. As I have said before, as a useful bedding plant and as a floricultural novelty it has a place, and is deserving of interest and study.

I forwarded Mr. Burbank for his approval and correction the above article, and I take the liberty of quoting from his letter in reference to it: "Your description of the Burbank's fadeless flower is exceedingly valuable and correct, and I thank you heartily for this authorised description." In regard to the value of the cephalipterum in millinery work, he says in this letter: "As to the millinery part of the business, the largest millinery establishment in the world has, after examining the flower with great care, desired me to hold it for him without regard to price. This being an old and established firm, fixes forever its value for millinery uses, so you may rest assured on that matter, for it is fixed for all time by this decision coming in this way from the most extensive dealers in existence." One thing which can be depended on is the honesty of Mr. Burbank, and this quotation from his letter will show the value of this most interesting novelty.

W. R. PIERSON.

VIOLAS.

In order to preserve these in a floriferous condition, remove all seed pods and the more advanced flowers, and the plants will bloom with renewed vigor.

They will enjoy a much longer season of bloom if the seed vessels are systematically removed and the plants are well supplied with water during hot spells.

CLEMATISES.

Amongst the many creeping and rambling plants with which our gardens abound, or may do so if we wish, the Clematises stand out as of conspicuous excellence. From this splendid family may be chosen plants that will grow in almost any garden and in any situation, which is more than can be said for most other genera. True, they sometimes fail with unexpected suddenness, and without an apparent cause, but we may say the same of many other things that have not got such a bad name for the fault.

I should like to see Clematises in goodly numbers in every garden, for they are indubitably worthy of all the honor that can be accorded to them. What matters it if a plant now and again does die? They are procurable at such reasonable prices that it is not a serious item in the garden account if one or two have to be bought in every season. For several years Messrs. Jackman & Son have been busily engaged in developing this genus, but it was not until the late Temple Show that it was fully realised how strikingly successful had been their efforts. The exhibit then arranged was wonderful, as illustrating the superb beauty of these plants, and it should certainly give a great impetus to their cultivation.

There are several distinct types of Clematises, almost all of which are represented by varieties of different colors, and one may say that all of them will adorn a garden. But to grow some dozens is not possible when space is limited and a rigid selection becomes essential. Fortunately the skill of the raisers has been directed as well to the extension of the range of coloration as to the development of size, and we now have a choice from which all may secure the colors that meet their appreciation. There is no necessity for any one to dilate upon the charms of such favorites as Flammula, indivisa, montana, and Vitalba, as these are universally acknowledged, so I shall devote my space to the enumeration of some of the forms of coccinea, Florida, Jackmanii, lanuginosa, patens, and Viticella in the order of their names.

The coccinea section is made up of hybrids which are ever growing in numbers and in beauty. The following are very fine: Countess of Onslow, violet purple; Duchess of Albany, bright pink ; Duchess of York, blush pink; and Ville de Lyon, carmine. If newer, and proportionately more expensive ones are desired, try the magnificent King Edward VII., violet puce, and Queen Alexandra, pale lavender and purple.

The varieties of C. Florida are admired by every one for their delightful flowers. Here are three beauties: Belle of Woking, silver grey; Duchess of Edinburgh, pure white, fragrant; and John Gould Veitch, lavender blue. Each of these produces double flowers. To praise the grand Jackmanii were superfluous indeed, for it is the most beloved of all. The variety superba is superb in fact as in name; while alba is the acme of refinement. Two others that should not be overlooked are Madame Edouard Andre, bright red, and Prince of Wales, puce purple.

Let us now glance for a moment at the lanuginosa section with its glorious flowers. Alba magna, pure white; Blue Gem, pale blue; Louis van Houtte, purple; and Otto Froebel, grey white, may be regarded with favor by planters. Of the patens division one could scarcely overpraise Fair Rosamond, blush; Lady Londesborough, deep mauve; Miss Crawshay, pink; and Mrs. G. Jackman, satiny white, for their charms are such as to grow upon us all. To complete the sections we have the Viticella forms, of which the variation from the type known as rubra grandiflora, claret, is superb. A pair of beauties might well comprise Hendersonii, purple, and Lady Bovill, grey blue. Every one of those included in the foregoing selections is worthy of a trial, and if the colors suit the especial taste of the cultivator they are sure to bring delight.

H. J. W.

GODETIAS.

Among the many annuals which we can grow with the greatest ease in our gardens we are fortunate in being able to include the beautiful Godetias. Suitable alike for sowing in clumps, in lines, or in borders devoted exclusively to them, they never fail to secure a very large share of attention and admiration. The plants, if they are grown from seeds sown in good soil, will produce flowers of considerable size, very rich in color, and of charming form, over a very protracted period.

Complaints have been made that all annuals are fugacious, and no doubt this is true in some degree; but if we admit this as a fault we are forced to recognise the fact that where the plants are properly treated the flowers are borne in such constant succession that their transient duration is scarcely appreciable. Deeply worked soil that has been enriched with good natural manure is the primary essential; the seeds must be sown thinly, the young plants must be thinned early, and to a distance of at least 6 in. asunder, or the greatest success need not be looked for. But beyond all these comparatively simple things we have one other detail of imperative importance, and that is the constant removal of the dead and decaying flowers, for directly this is neglected the plants turn their best attention to seed production instead of to the development of further supplies of flowers. A border of these delightful annuals as seen in a cottage garden is represented in the accompanying illustration.

To those who do not want to produce any particularly striking effect, the packets of seeds of mixed varieties will appeal; but to those who desire the best possible display named varieties are strongly recommended. Some of the best are Duchess of Albany, white; Lady Albemarle, crimson; Lady Satin Rose, rose; Princess of Wales, ruby crimson; and The Bride, white and carmine.—D. W.

SEEDLING CARNATIONS.

Because it is a most fascinating line of work, full of interest and pregnant with possibilities, the raising of seedlings is now undertaken on nearly every place where carnations are grown. All the details of cross-fertilization are now fairly well understood, as also the essential points which count in the judging of a carnation and in the selection of parents for a progeny, which, it is fervently hoped, will bring with it at least one, possibly several, brand-new prize-winners. All this is very nice and proper, and should not be set down as merely a profitless waste of time and labor. It begets and fosters a deeper knowledge of plant life, creates an interest in nature's hidden workings, inspires hope and gives pleasure, and is more likely to advance than to retard floriculture. Therefore, let us rest content and not deal out discouragement to those anxious to grow seedling carnations.

Although the manual part of cross fertilization in the case of indoor carnations may to good advantage be carried on at any time during the entire winter, the months of November and December have been found to be the best time to take this, the first and most important step toward the raising of a good batch of seedlings. Another essential point is to sow seeds when they are ripe. Occasionally if not taken off in time, the seeds will sprout while still in the pod, especially if the house is kept rather moist. More often the seeds rot if not gathered in when ripe. For this reason alone it is advisable to keep a close watch. When the pods have lost their crisp green color and appear to be drying up, turning to a brownish-yellow in spots, they should be cut off, placed in a dish or on a sheet of paper, left to become entirely dry in the sun or near a warm place for a day or two, when they may be broken up and the seeds sown without further delay. Those seeds that have sprouted while yet in the pod must be carefully handled and sown at once. The subsequent care and treatment of the seedlings does in no way differ from that of other plants of the same nature.

Marguerite and other types of bedding carnations, if nice plants are wanted for early planting. They all are good for the garden and useful as a chance pick flower. All of the marguerite section will flower the first season, and, if the seeds are sown early, will produce any amount of picking material the entire summer, after which their usefulness is ended. To this class belong the really fine varieties of the Chabaud and Guillaud strains, raised in France, and a marked improvement on the old time, straggling, and small-flowered marguerite carnation. These are worthy of the choicest place in any garden. The plants are sturdy, growing into dense bushes and producing great numbers of very large, fragrant flowers on long, stiff, and upright stems. The colors are bright and of every shade to be looked for in carnations, including evey tint in yellow, selfs, and variegated.

Those excellent old favorites, the dwarf Vienna and the Grenadin carnations, the latter in three or four fine varieties, should be started from seeds in the first part of March, so that strong plants may be had by October, when they should be potted up and given cool winter quarters. They flower the second season.

Rooted Cuttings.

One of the most important features of this country's plant trade to-day is the traffic in rooted cuttings. From a small beginning some twenty years ago, it has developed into an industry of immense proportions and far-reaching consequence. It has, in a great measure, simplified and made less expensive and more convenient the intertrade dealings in most of the leading kinds of bedding plants and greenhouse forcing stock. This mode of plant distribution offers an excellent opportunity to all such florists, whose stock is deficient in any of the leading or some of the coveted new varieties, to complete their stock. In the packing and shipping of rooted cuttings, as practised now, a great improvement is noticeable over the careless methods in vogue not many years ago, and buyers find little cause for complaint on this score. It must also be admitted that the quality of rooted cuttings received from any quarter of the country at these times is far superior to that of the diseased, shrivelled, and rootless rooted cuttings so often found in shipments delivered in former years. If, as this trade is conducted now, the cuttings received are true to color or name, as ordered, a failure of the new arrivals to come up to anticipations must then be laid to the shortcomings of the variety, or those to be found in the cultural methods of the buyer.

Much depends on how rooted cuttings are handled and cared for when received, and even the soil used in potting them off frequently becomes a fertile ground for the seeds of future trouble. The packages should never be torn or pulled in a ruthless fashion from out the box, but taken out carefully, following the packers courses by reversing the order and starting with that package which was the last one in packing. Unless sufficient help is taking part in the work of unpacking and taking care of the contents of the new shipment, no more should be taken out and unwrapped than can be handled at a time. The less rooted cuttings of any kind are handled after their journey, the fewer roots and the less moisture at their roots will be lost.

Some people put great faith in a dipping of the roots in water before potting; especially is this thought to be necessary when plants arrive in a shrivelled or dry condition, as is often enough the case. I do not approve of this plan, unless for the lack of time the immediate potting up or planting has to be postponed for an indefinite time. If the planting is done at once, as it should be, it can be accomplished in a quicker and more proper way with plants, not dripping wet, and a thorough watering after planting, or potting, will reach the roots just as well and will save them, too, unless they were beyond salvation before they were potted up, and in that case no dipping would have saved them or brought dead plants to life.

The grower anxious to get his new acquisition into pots, should beware of old, stale, soil out of the next best bench. The freshest and sweetest soil on the place, with little or no manure in it, should be used for the new-comers, if they are considered of value at all, and sufficient of such soil should be ready and at hand at the time the cuttings are expected. Should these not be just what the order called for, or in a condition which justifies non-acceptance, the sender should be notified without delay. Meantime, air should be allowed to reach the plants by removing the upper tiers, if there are more than one, to a safe and shady place, and keeping the entire consignment in good shape, until the arrival of final directions from the firm that sent the cuttings. No good florist should fail in this.

There is one kind of rooted cutting I detest, although it is welcomed by most of the inexperienced growers. This is the early-struck, over-grown, lanky cutting with a green crown and an ossified stem. In the case of new and high-priced carnations, the sending out of a lot of Fall-rooted cuttings in February is nothing unusual, and the unwise buyer, who insists upon having his order filled early, is most likely to get these pickled cuttings. In nearly every case he cuts them in two, tries to root the upper half, and nurses the inert, lifeless lower part, until all doubts as to its fitness for the dump pile have vanished. In the hope of obtaining double value for his money he runs the risk of losing all of it. Even should he succeed in rerooting the top ends and in saving most of the stumps, the outcome will be a lot of plants, entirely unqualified to demonstrate the good points vested in the new and perhaps most excellent variety. It is safer to simply pinch, or pull, out the extreme tops of such cuttings when received, or pot them up first and stop them a week or two later. No halving of lanky cuttings should be practised, unless they are very long, well-rooted, and provided with fresh, healthy foliage clear down the stem, and even then it would seem a wiser proceeding to just nip away the soft top of cuttings so good, and give them a chance to do their best. Cuttings arriving in a frozen condition must be gradually, slowly thawed out, before they are unwrapped, and will then show the extent of the damage done, if any.

Fred W. Timme, in "The Florists' Exchange."

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HIGH PRICES FOR CARNATIONS.

"That any one sould pay 20,000 dollars for a carnation seems, at first glance, a waste of good money, for a fad. A wealthy resident of Tarrytown-on-the-Hudson is reported by telegraph to have paid this big sum, however, for a new flower developed by a Rockland, Mass., florist. But Thomas W. Lawson, the vigorous Boston writer on 'frenzied finance,' paid 30,000 dollars several years ago for the world-famous pink carnation which bears his wife's name, and last October Harlow N. Higgonbotham, of Chicago, who vainly endeavored to get possession of the Lawson pink, paid 10,000 to a Lafayette, Ind., florist for a flower of the same kind, which is said to rival Lawson's in beauty.

It is a mistake to suppose that these extraordinary investments in a single rare flowering plant constitute a dead loss to the purchaser or a clear profit to the seller. Each one of these rare plants doubtless represents to the producer years of intelligent and patient labor and experimentation. Thousands of failures are recorded against one successful result, and hundreds of florists work in vain where one scores a triumph. But the buyer of the costly prize invariably turns it to commercial account sooner or later, and more than likely gets back the principal with good interest in the long run. The newly-developed 20,000 dollar carnation is an eccentric production found in a bed of Lawson, which proves that the flower for which the Boston millionaire paid 30,000 dollars has been made an extensive article of commerce since he made the investment."

This is a clear case of "many men, many minds," but one thing is certain, that the carnation, on account of these extraordinary alleged purchases and sales, has gained more notoriety through the public prints than has ever before been accorded any other flower. And, surely, such publicity increases trade to an extent that counterbalances the evil which men do in spreading such stories, and which, like all other evil, supposed and real, is interred with their bones, the good alone remaining.
—"Florists' Exchange."

FLOWERS IN WINDOWS.

Amongst the various objects which tend to brighten up highways, nothing is more effective than the flower decked cottage windows which are amongst the common and delightful features of any country. A window gay with flowers is indicative of a true gardening spirit prevailing within—a spirit which all horticultural authorities will do well to foster, for the associations of plants and flowers have an uplifting effect on all those who can be induced to take an interest in them.

No one turns to look at a flowerless window twice, but there are some that are a source of general attraction to the passers-by through the display they present, not now and then, but always. It is a mystery to me how some people manage to keep up a constant show of bloom in the window with the limited facilities they possess, and particularly so when one considers that the household stock of horticultural knowledge is of a self-acquired and very primitive character.

We are wont to look upon the lady gardener as a modern invention, but she is really nothing of the kind, because, for years past, women have been responsible for the window department in hundreds of lowly establishments, and illustrations prove whether they have succeeded or not. I know of nothing more pleasant than to chat with a grandmotherly old dame about her window plants or "tree pots," as she frequently calls them. She treats them more as children than plants, and knows the history of each specimen by heart. Her wrinkled old face beams with pleasure as she tells how she obtained her splendidly grown Lucy Finnis Fuchsia as a "slippin'" from a friend, and "growed" it up to what it is now.

Zonale Pelargoniums are things which she does not pretend to know anything about, but she is well acquainted with these plants under the family name of "Geraneums," and if any one has got a variety which she does not possess, no greater favor can be bestowed on the old lady than to present her with a "slippin'." She evidently thinks that the plants possess her own liking for tea, for the drainings from the pot are religiously put aside and applied to them cold, and in the old lady's estimation no other liquor has the same fertilising properties as her favorite beverage. In no other instance, in fact, is the personality of a grower imparted to plants more than in the case of an old lady who possesses a love for window gardening.

A glance at windows here and there indicates what plants lend themselves most readily to this class of culture. First and foremost is the popular Geranium, and hundreds of specimens grown in cottage windows are sources of real pride to their owners. The Fuchsia is another plant inseparable from windows, and the double Petunia is also a prime favorite. More than once I have seen specimens of the Scarborough Lily growing in cottage windows that have struck me with envy, and where do the pretty little blue Campanula isophylla and its white variety alba thrive better than under domestic culture, hanging in the light giving aperture?

They strike me as being little horticultural worlds, these flower bedecked windows, peopled with plants, apparently happy in the associations around them, and lovingly cared for by hands that work hard in daily toil. Lessons they undoubtedly teach; yea, and also preach mute sermons, one of which points to the charms of floriculture that appeal to all sections of humanity, both young and old, rich and poor.

VERNON.

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PLANT IMPROVEMENT BY HYBRIDIZATION.

(By H. H. Groff.)

The Darwinian theory as to the natural creation of species is none the less true, but that such theory was intended to be accepted as an insuperable barried to the results of scientific effort could never have been thought of. It stated what we know to be perfectly true in nature—that the creation of wild species requires ages of time. But as I have recently expressed it: "The unfettered mind of man has bridged the ages, and in hastening evolution by hybridization has rushed into the eons of the future, and laid ther treasures at our feet."

It would not be possible in a paper like this to detail the many points and features of this important aspect, resulting in my experience from my recognition of domestic species among my advanced creations, during years of constant and critical observation in the field, from several hundred thousand new seedlings of the gladiolus, as such detail is capable of limitless elaboration as to its actual and possible application in scientific and economic plant breeding.

You will appreciate my statement when I say that, although endowed with a fertile imagination and optimistic temperament, with the added advantages of a life of business training to perfect my mental balance, I confess to a feeling of helplessness at the immensity of the visible field for practical, valuable and useful results arising from my limited application of the system of plant breeding advocated by me.

I used the word "limited" advisedly, for the reason that my use of parents bred from various wild species has been with the object of meeting existing commercial and popular demands, and consequently I have only attempted a few of the many lines of possible use at my disposal. You will, therefore, understand me when I claim the limitless possibilities opened up by the few lines so selected, as compared with an attempt to compass the immensity of the whole of the visible field.

Here again the visible field is found to be but a border of the limitless reaches of eternal possibilities, and can you wonder that if the human mind palls at the prospect opened up by a fraction of its revelations, how may we hope to grapple comprehensively with its immensity, were even a portion of the remainder effectively availed of. Then, further experiments in a fraction of a section of the visible field have proved to me that even here the development of new forms and types promises to multiply indefinitely in the sub-section so chosen for elaboration; so that specialization becomes imperative, and having chosen the best lines apparent to our restricted perception, it would not be wise—if it were possible—to return to the centre, and radiate indefinitely in aimless experiment.

The practical and general application of my system may be outlined as follows: In order to secure the benefits of existing material, make crosses between every available type, regardless of apparent objectionable characteristics. Select sires from these and use on every wild species obtainable, on special and general lines—crossing and recrossing until desirable types are produced. Then bring the selected offspring of all wild species together in intercrossing on special lines, as each wild species will prove more useful than another in some individual feature valued by us, for, as already indicated by me, specialization becomes inperative.

The result of the foregoing will be the creaton of new domestic specific types, valuable as sires for use in revitalising crosses on existing varieties of merit, and the production of new forms and types of unexpected quality and value.

"Selection of varieties and raising naturally fertilised seedlngs from such selections is only a short step toward an infinitesimal fraction of the possible satisfaction open to all plant breeders, who must be considered as advancing, more or less slowly, the ever-rising—but never to be fully risen—sun of scientific horticultural achievement.

"The first step should be hybridization or cross breeding between such selected varieties—irrespective of color or race—to the limit of variation and stability, with a contemporaneous systematic effort to develop domestic specific types from every obtainable wild species, by using pollen from these advanced selections. These efforts should be conducted on many lines, with the hope of rendering the possibilities of each species controllable for the definite use planned by the operator.

"For example, if the desire is to produce a white section, every effort should be made to originate such colors and shades from every known wild species, without regard to their colors. When fixed types of a desirable character have been so produced these should be used as sires on selections from existing varieties as mothers, for the creation of new and valuable economic types.

"While the foregoing operation is progressing for the production of commercial types, crosses should be made between all of these sires on individuals prepared for use as mothers by removal of the anthers before ripening of the pollen, with the object of creating new and distinct domestic specific types to be used as the progenitors of new forms and races, as well as for the revitalization of strains possessing valuable characteristics worthy of perpetuation and elaboration.

"The results to be obtained from blending vital forces that have been isolated for ages in the natural production of wild species give unbounded satisfaction, and the pleasant surprises are only limited by the activity of the worker.

"In my work on the gladiolus, some of the most beautiful red shades come from crosses between light types that had been revitalised by a dash of choice red blood from new species. The effect of working through the light section added most materially to the substance of the flower.

"My highest satisfaction, however, is from a series of new forms with large, round, cup-shaped flowers, like the tulip or nymphæa. Many of these are self colors, ranging from pure white to lilac and pink, with intermediate shades of the most delicate shell pink and flesh tints.

"Multiplicity of the floral pieces, as in semi-doubles, is now quite frequent. Infusions of such blood induce twinning from the seed so produced, a point that proved most interesting to Professor Bateson, of England, at the International Plant Breeders' Conference, New York, 1902.

"Valuable and interesting variations like the above are among the side lines of limitless possibility yearly made apparent to the ardent worker, and selections made by me from over a half million of my new creations give promise of endless satisfaction, as well as increased opportunities for greater and more rapid progress in the future."—"Florists' Exchange."

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TABLE DECORATION.

I am quite sure that the use of baskets of flowers on tables would be a welcome change to the exclusive employment of vases. Not only on dinner tables, but also on drawing-room, corridor, and odd side tables, or other articles of furniture, baskets filled with suitable flowers and foliage would prove a most attractive feature. Lightly constructed plain baskets are most satisfactory, especially those with high arched handles, the body gracefully curving outwards, well set up on a deep foot, and not squat in appearance.

For a medium-sized dinner table one basket as a centrepiece will be sufficient. On a very large table one basket in the centre and one on each side of it, but much shallower, would do well. Shallow or deep vases must be put into the baskets, according to the depth of the latter, to contain the water necessary for the flowers and foliage. The arrangement in every instance must be a light one, or there will be a decided failure. Valuable use may be made of tree and other foliage in the embellishment of these receptacles where flowers are scarce; indeed, I think a judicious mixture of flowers and foliage in most cases, and foliage only in a few others, will give the best results.

What a splendid effect has Honesty, or Moonwort, as it is sometimes called, associated with light grasses of various kinds, especially when a few touches of color are added by using scarlet Geraniums; both the latter and the silvery shields of the Honesty show up to great advantage in gas or lamp light. A few strands of Ivy entwined around the handle and the outer rim of the basket would make a suitable and graceful finish, and the whole arrangement will last for many days.

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PLANTS FOR A WINDOW GROUP.

I refer to plants for a group inside a room, and not on the sill outside the window. A dwelling house, with two fairly large windows in the front, whether they be flat or bay-shaped, will look extremely attractive after the addition of two groups of plants.

The form of the group should be circular; then it presents a good front every way. Persons inside the house, and others passing outside, get a front view of the plants.

Whether an ordinary table or a valuable one be used, a tin tray should be placed on it to contain the pots. If water is carelessly given at any time, the tray will prevent the surplus falling on the carpet or polished floor.

A nice palm for the centre of the group is very desirable, but not indispensable. The following kinds are suitable: Latania Borbonica, Chamerops excelsa, C. Fortunei, C. humilis, Phenix dactylifera (the Date Palm), P. reclinata, P. tenuis, Sabal Blackburniana, and Seaforthia elegans. The last named is a very graceful palm, and is good for the centre.

The chief plant should always be a little higher than the others. Of course, different kinds of plants will be required for spring, summer, autumn, and winter. I will here only name those which are chiefly suitable for the summer and autumn. The palms and certain sorts of ferns will do well all the year round. Bulbs and Chrysanthemums come in for autumn.

The Maidenhair Fern (Adiantum cuneatum) and the Pterises are always pretty associated with other plants, such as Zonale Geraniums, Fuchsias, and Petunias. The last-named plant is generally grown for bedding out, but a few of the single flowered sorts make a brave show in a window. Clivias, Dracena indivisa, Coleuses, Epiphyllums, and Abutilons, with Musk, Campanulas, and Isolepis to fringe the edge of the group, may be chosen. They are somewhat expensive, but they will last fresh for a long time.

Zonale Geraniums, Fuchsias, a few hardy ferns, and several pots of Mignonette, with various other annuals, will also be most effective.—G. G.

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PLANTS ON THE BALCONY.

The employment of growing plants upon the balcony produces a very charming effect, whether the house be situated in a town street or in the country. Their individual attractions, of scent, form, or color may be fully enjoyed in such spots, just outside the windows.

Some creepers are desirable. Probably the balcony will have tall supports at the ends, some are partly roofed in, or there will be a railing that can be climbed by vegetation; but, if not, climbers look pretty growing up Bamboo sticks that are latticed together by twine. These supports can be fixed in the large pots or tubs, and two climbers so grown, placed on each side of a long French window, will form a delightful addition to it.

Creepers that are suitable for this purpose are numerous, but town dwellers cannot hope to grow very many of them. Tropeolum Canariensis is perhaps the best of all for London use. This graceful climber is lovely in foliage as well as in flower. Nasturtiums will also thrive in a foggy atmosphere, and their various colors are more exquisite than is imagined by the unambitious gardeners who cultivate the ordinary orange variety alone year after year. I have seen the walls of a London house, in full sunshine, made beautiful by a show of many tinted Convulvuluses; the plants were growing in deep, narrow barrels of rich soil, and evening syringings kept the foliage of a fresh healthy green.

For a permanent ornament the yellow winter jasmine is a success when grown in tubs; Pyrus Japonica, Crategus Pyracantha, and Clematis montana will flourish for several years, and some triumphs were made last year with Brier and Rambler Roses.

The plants, shrubs, and trees that are grown in tubs can receive attention every day, such as judicious watering, feeding, and winter protecting. The foliage will not suffer if it is often washed, and the roots can revel in a perfectly adapted soil; whereas plants in the garden have to battle with insect enemies, are often subjected to droughts following deluges, and receive little, if any, stimulating food. Ivy-leaved Geraniums, Fuchsias, Begonias, miniature Roses, Violas, dwarf Antirrhinums, white and yellow Marguerites, Dahlias, early Chrysanthemums, Verbenas, Heliotrope, African and French Marigolds, will help to make color combinations on the balcony.

In the country a Sweet Pea display on the balcony cannot fail to be a success.

L. H. HOWELL,
MT. VICTORIA, N.S.W.,
has imported per steamship Fifeshire
TEN CWT.
GLADIOLI,
embracing
200 Finest European Varieties,
for
Autumn Flowering.

DAFFODILS.

"I am tired of growing Hyacinths," observed a friend of mine just recently. "I spend money on bulbs every autumn, and after they have flowered once I never seem to see any more of them. I want something that can be relied on to come up again."

Here was my chance; I recommended Daffodils, as I do now to any one who may be in the same predicament. I look upon money spent on these bulbs in the light of an investment, because in addition to the enjoyment derived from the flowers, they increase so rapidly as to return the capital with interest in a few years. Yet the accommodating nature of the Daffodil in this respect is often detrimental to its own interest, because bulbs are frequently planted and then left to multiply and overcrowd each other.

When bulbs are naturalised in turf there is no need to disturb them, but when grown in beds and borders they should be lifted every few years and divided, not only for the sake of increasing the stock, but also in the interest of bulbs and flowers, both of which deteriorate in size and strength if this operation is entirely neglected.

Two years ago last autumn I planted a number of bulbs of that superb Daffodil, Sir Watkin, and this spring, after the flowering was over, I lifted a clump for inspection. In the place of one bulb I now have three, all capable of flowering. Though growing together in a clump the bulbs were not joined when they were lifted, except through the interlacing of the roots, so that division was easily effected by shfiking out the latter.

Spring is the time to decide whether the Daffodils should be lifted and divided or not, but the operation should be performed when the bulbs are at rest. After the foliage has died away lift the clumps with a fork, pull the bulbs apart, and replant them. I can hardly give rules as to the depth to which bulbs should be planted, as the latter vary so much in size; but it is a good plan to cover them with about as much soil as the bulb measures in height.

Daffodils do so well in the majority of gardens that the grower has no need to worry himself on the score of soil. Little or no manure is required if the soil is of a fertile, loamy character, but if it is poor a dressing of decayed farmyard manure may be dug in several inches below the bulbs prior to planting.

Finally, let me advise those who have large, long established clumps to spend a little time this summer in dividing and transplanting, for the double purpose of improvement and increase.

VERNON.

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HOW TO MAKE A ROCKERY.

You can make a pretty rockery with almost any stone, provided that the planting is properly done so as to hide any deficiencies in the material. As to the formation of the rockery, you can either make a framework of stones first, or make a mound of earth and face it up with stones afterwards. Both methods have their advantages and their advocates, but you will find the latter the simpler and easier. If you elect to adopt it, make up your mound to the desired height, making the soil firm, so that it will subside as little as possible. Then place the stones in position, beginning with the bottom row all round and gradually working up, packing up behind the stones with soil as the work proceeds, so as not to leave any cavities. If, however, you prefer the other method, first place the bottom row of stones in their places, and then fill up behind with soil to the level of where the next row is to be placed, and so on until the proper height is attained. See that the stones are firm and will not be dislodged by treading upon them for access to the plants, also that they lean slightly inwards at the top. You will find that the plants do best if the rockery is arranged in a series of flat terraces, each row of stones receding a little from the other, so as to leave spaces for the plants. It may look a little stiff at first, but in a short time the growth of the flowers will change all this; while the plants will thrive better and give less trouble. I shall be pleased to be of further service.—S. R. N.

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POTTING.

Probably the commonest mistake made in the garden is that of filling flower pots too full of soil. Even professional gardeners of wide experience are not blameless in this respect. In the summer the evil arising from carelessness in this respect is far worse than in the winter, when, indeed, a too full cramming of a pot with soil has frequently been the salvation of a plant under the care of a heavy handed waterer.

A plant in a pot very full of soil rarely, if ever, gets a thorough watering; its top roots may be moistened, but its lower ones are frequently dust dry for days together. As a consequence, the leaves turn yellow, the plant droops and dies, and the cultivator becomes disheartened, and maybe abuses his nurseryman for supplying unsatisfactory stuff.

A too full pot allows of no room for top-dressings, and these, as most of us know, are one of the greatest aids to successful plant culture. The water pot is also more constantly in requisition to keep its surface soil moist than is the case with its less filled companions. Roots frequently push near the surface soil of a pot, and so reduce the distance between it and the brim of the pot. When this is so, repotting is the cure, taking care that the ball is placed lower in the new pot.

It is hard to give a rule for the filling of pots, as these vary so much in size, but the smallest should never have less than ½ in. of space between the top of the soil and the brim, while the largest sizes may range between 1 in. and 3 in. Top-dressings will considerably reduce the latter space, and will do away with the need for repotting.—E. J. C.

The Orchard.

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OPERATIONS FOR APRIL.

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Where long rank grass or heavy weeds occur in the orchard, mow and remove to a pit where it may rot into useful manure, or feed to pigs or other stock. Props and supports of all kinds should be removed from the orchard as soon as the crop is gathered. The tree itself should be strong enough to support its crop, and where other means are employed it is clear that trees have not been properly designed and cared for. However, if trees are loosely made, and bear heavily, some additional support must be brought in; but it is bad to leave these in or about the trees all the year round, as they cause wounds, and encourage a lot of filth which could not be generated on live and healthy wood.

In warm districts, where soil is mellow and sweet, citrus may be planted out. A stake should be placed to each, and the head thinned in the top, so that the wind will have no power to blow them about badly.

Start root growth in all weakly trees by cultivating and moistening the soil. Water may or may not be necessary. In any case, the object is to create a temperature and degree of moisture in the soil favorable to free root extension. This work of growing commences early or late, according to the season and geographical position. It is not right to cause the head of the tree to grow by any system of late summer or autumn irrigating and cultivating, as whenever this occurs a large proportion, or all the buds, are thrown out of use for the following year. In a mixed orchard, where trees are of various ages, shape, and degrees of vigor, different treatment must be accorded. Feed and encourage more root extension on the part of the young and the weakly, but let the strong alone till they produce more ripe and fruitful wood on the existing framework. It is often necessary to feed the fruit on a strong tree, through the absence of moisture or sap circulating in summer, but it is seldom advisable to give extra nourishment to its roots during autumn or spring. Remove any bandages which have been employed to protect weak and sensitive bark from the hot sun. It is always advisable to keep the bark of young trees soft and mellow, hence the great value of bandaging in hot weather; but if the bark is suddenly exposed by the removal of the protective covering during winter, it is liable to split and cause serious injury.

The leaves of all deciduous fruit trees should still be fairly strong and green. Yellow is the color in autumn leaves which gives the most certain indication of weakness, as no leaf which has been properly fed, done its work well, and remained sound unto autumn, will be wholly destitute of stains and blotches. Plum leaves are usually the first to fall, and they are often unduly hastened by the parasitic red spider using up all their vitality, so that they are powerless to hold on the the tree. Where leaves fall early, the buds remain imperfect, and crops must necessarily be light. Leaves should not grow in autumn, but it is distinctly necessary for them to feed and ripen well. See that the condition of the soil favors their doing this. Poor dry soils may be manured forthwith, but wherever there is danger of manure attracting too much water, lowering the temperature of the soil, and souring it during winter, manuring should be deferred till spring. According to the nature of soil, the climate, and constitutional vigor of trees, manure is applied in a falling or rising temperature. Naturally, the hardy may be manured in autumn or winter, where the weakly and sensitive require to be helped in spring or in early autumn ere the land is sold.

Table and Raisin Grapes.

At this season one is chiefly concerned in perfecting the wood for next season's crop. To this end the leaves are left open, that the bases of all shoots may be fairly exposed to the light, heat, and air. Very strong vines, and such as are trained low, suffer most from the imperfect ripening of the wood. Acres of ground may be got over in a day by a single hand in performing this work, and, allowing that there is nothing else of such importance and value as a crop of ripe, firm wood, it is well to see that the autumn and fall do not find such as is required for spurs and shoots green, coarse, and imperfect. Closely planted vine land cannot usually be dealt with till after pruning, but it is often sorely in need of loosening and moistening in early winter, whilst at other times furrows are needed to get rid of surplus water. Young vineyards should be kept constantly worked, and there is no better period than the present for giving a light ploughing and harrowing, so as to ensure a well aerated moist, warm soil, wherein roots may grow freely and provide the means for a strong head growth next summer. Damp raisins, currants, and sultanas should be placed on wooden trays heated to 120 Fahr., or thereabouts, and placed in warm, sunny positions, that they may dry off. The damper the fruit the smaller the parceling, or it will ferment and spoil.

—Agricultural Journal of Victoria.

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By W. J. Allen.

April.

In cases where the grower intends to give his orchard two ploughings, the first should be completed at as early a date as possible. Outside of this, the land should have as complete a rest as possible until the winter ploughing, when all weeds which may have grown will be turned under while still green, and before they seed. It is now rather late to sow seed for green crops, as there are very few crops which will make satisfactory growth between now and August, which month in most instances is quite late enough to do the winter ploughing.

Planting of citrus trees may be continued this month. When autumn planting is practised care should be taken in handling such trees not to expose the roots to either wind or sun for any length of time.

Codlin moth bandages must still be kept on the trees as, even after all the fruit is removed, an occasional grub finds its way to the bandage. All props shoulld be removed from the orchard and any grubs adhering to them destroyed.

Trees badly disfigured by the ravages of woolly aphis, are a source of danger in the orchard as are also rough-barked varieties of either apples or pears, as in the ruptures caused by the woolly aphis will be found numerous grubs; also underneath the rough bark; and it is a question whether it would not pay to cut all trees well back or down, which are in very bad condition, as I feel sure it will be impossible to eradicate the moth while the trees offer such excellent harbor for the grubs. It is very noticeable when removing bandages that those trees which are badly disfigured with woolly aphis are rarely found to have many moths under the bandages, but in a close inspection of the knobs grubs may be found in all of them, and where this is the case there is but slight hope of ridding the orchards or district of this pest.

All dormant bud ties may be removed this month.

The stones and pits of the different fruits required for stock raising may be planted this month.

Trees required for refills or for planting new orchards should be secured as early as possible, and all land which is to be planted should be prepared without delay.

In purchasing trees, deal only with nurserymen who are known to have a good reputation, and who are raising their own trees, as it is to their interest to supply nothing but good stocks if they hone to do any future business. There is nothing more discouraging than to find after growing trees for three or four years that the varieties are worthless.

Growers in different localities often find that they have a variety which is doing exceptionally well in their particular district. In this case, if they are not sure of the name, and cannot get it properly named, I would recommend that they should send their wood to a nurseryman and have him work as many trees for them as they require. In this way they are sure to get exactly what they require, and I feel sure there is not a nurseryman who would not undertake to carry out such a contract carefully.

Two or three good varieties are much better than two dozen, and one case of good fruit is generally worth as much as three or four cases of poor fruit—therefore, it is well to exercise great care to choose only the best if it is hoped to make fruit-growing pay.

To those who are interested in the subject of cider-making I would recommend securing a copy of the Report on the Results of Investigations into Cider Making, carried out on behalf of the Bath and West and Southern Counties Society, in the years 1893-1902, by F. J. Lloyd, F.C.S., F.I.C. This report can be purchased from Messrs. Eyre and Spottiswoode, East Harding-street, Fleet-street, E.C. It gives details in connection with the handling, storing, grinding, pressing, extracting, filtering, bottling, &c., &c. The report contains 145 pages, and its price in London is 8d.

The "California Fruit-grower" for November, 1903, contains a description of a new navel orange which is being grown in Florida. The bud from which the new orange originated was obtained in California. The fruit is named the "Surprise," and it is believed that it will do as well in Florida as the Washington Navel is doing in California. It is described thus—flesh, fine grained, yellow in color; juice, abundant; acidity and sweetness well blended; flavor, rich, vinous; quality, excellent; no seeds ;ripens about the same season as the Washington Navel. It has fruited well for three years, and is, therefore, looked upon as a decided acquisition by Florida planters.

The Department of Agriculture will try and secure some buds or trees of this variety as early as possible.

In the same number of the afore-mentioned journal is given the Teague process of curing lemons. Three things are insisted upon, viz.: The lemons must never be allowed to sweat; they must never be in a draught or damp; and the yellow and green must be separated. Subject to this they are given all the air that can pass through a canvas covering in an open shed. Mr. Binney, a lemon grower of San Diego, is under the impression that lemons kept in Messina boxes in sheds, closed by canvas on all sides, except those from which the prevailing winds come, will cure equally well without canvas coverings for each pile of boxes. It would be well worth while some of our growers giving these methods a trial.

—Agricultural Gazette of N.S.W.

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DISEASES IN THE ORCHARD.

By A. G. Campbell.

Nowadays the orchardist finds around him a considerable number of pests and diseases, which take more than a fair share of his profit, taxing his patience and energy to the utmost, when he endeavors to fight them. These irregularities are due to various causes, which may be put into two groups—(1) internal predisposition, either from the nature of the plant or from its environment, soil, temperature, &c.; (2) external causes, or those resulting from attack by living organisms, which are regarded as pests because they devour various portions of a plant grown for economic purposes, and many fungi also, minute forms of vegetable life, which are parasitic on the higher forms. It must be admitted, however, that these attacks are often encouraged by the presence of the first group of causes, that is, when certain trees are so weakened in constitution by being placed in adverse conditions or under bad management, then they are subject to certain organic diseases. To have the subjects in good health is the best guarantee against these attacks.

Before the irregularities in the orchard trees can be successfully dealt with, especially those resulting from organic causes, some idea must be gained, not only of the symptoms, but also of the nature of the of the disease. Then, when the orchardist is sure of his ground, he can strike at the very heart of the infection, and quickly remove it.

The diseases due to vegetable or fungous organisms are, perhaps, more to be feared than insect pests, because they are so microscopically small, and grow in such an insidious manner that, in many cases, the damage is done before anything is seen of the cause. Fungi are placed by botanists very low down in the vegetable world, and are grouped with seaweeds, lichens, ferns, and mosses, as the plants which do not produce flowers, and, therefore, have no seed. Reproduction takes place by means of little bodies, representing seed, called spores, which appear in immense numbers. When combating fungous diseases, these spores are what the orchardist must endeavor to kill, or otherwise prevent from growing.

There are some seasons when certain fungous diseases, black spot, for instance, is much worse than in other years; the same remark applies to all fungi, but all kinds may not be prevalent at the same time. When black spot is plentiful, it does not mean that leaf rust will be plentiful too. Each has a certain degree of temperature and moisture in which it will thrive well. All the world over, among all the vegetable kingdom, it is ever thus, that what suits one plant may not be exactly the thing for another.

Many things conspire to bring about what is termed a "bad year" for a certain pest. It may be the result of a sequence of many good seasons of growth, in which the spores become more and more numerous, until a climax is reached; or it may be worked up in two seasons, if they be favorable. Firstly, there must be a good season for the production of myriads of spores; secondly, this must be followed by a mild winter, during which few, if any, of the hibernating spores are killed by cold or wet; and then, thirdly, a second good season of growth must follow to still further increase the pest. But fortunately such a combination does not often occur; Nature is to a certain extent on our side. It often happens that a "bad year" is followed by a sudden and conspicuous absence of disease; this is due to climatic influence; and the vagaries of climate are responsible for the killing of more disease than our present irregular systems of treatment.

Spores, however, possess great vitality, and may lie for several years in a dormant state, should conditions not be favorable to growth. In this fact is found the reason that the most successful sprayings for fungous diseases are now recognised to be, not the applications in winter, but those given in spring, just when the fungi are becoming active and seeking to obtain a hold on the unfolding leaves or newly-set fruit.

There are many fungous diseases on our fruit trees which, to some in one district and others in another, prove themselves serious pests. The principal ones will be selected, and a popular description of each, together with the readiest remedies will be given, commencing here and continuing through subsequent articles.

Powdery Mildew of Apple.—As the name implies, this fungus appears like a white down or mildew over the leaf of the apple. It is only troublesome in the cooler districts, where sometimes it spreads very quickly, attacking young leaves as they unfold, causing them to be distorted and unable to fulfil their proper functions. Both sides of the leaf are attacked, and the disease, if unchecked, will spread over a whole orchard in a short time by means of myriads of spores it produces.

The mildew is said to be particularly bad among nursery stock, possibly its ravages are more apparent among small trees. A moist, warm spring and summer are most conducive to its spread. When the young leaves are thus prevented from maturing, not only do the growing shoots become stunted from want of nourishment, but the whole tree will suffer from the exposure brought about by loss of leaves; the fruit also will be ruined. In bad cases the result of the disease is seen the next year, even if the actual fungus is not present again, for the effect is such that good growth and healthy fruit spurs have not been made for the next crop of fruit. So there is the necessity to check the fungus as soon as it appears, that it may not spread further, for the white downy appearance of the affected leaf is caused by the presence of countless spores, each of which is capable of being blown, or otherwise carried to new leaves, and the fungus reproduced on them.

Remedies.—In districts where the powdery mildew is known to be prevalent, or when a bad season for the disease is expected, spray early, just when the buds are unfolding, with the summer strength of Bordeaux mixture prepared by mixing 4 lb. of sulphate of copper (bluestone) and 4 lb. of lime in 40 or 50 gallons of water. The bluestone must be well dissolved, and the lime freshly slaked before using.

The first spraying checks the disease by killing the fungus plants just as they are beginning to grow on the young leaves, and so the latter have an opportunity of expanding properly. But so quickly does the disease spread from other quarters that it may be found necessary to spray again in a few week's time, or even several times during the season, in order to protect the growing shoots.

Should the early spraying be neglected, and the disease be found to have a hold on the shoots in spring, it is then not too late to attack it. A spraying at once will kill numbers of spores, and prevent them spreading. Although the leaves already affected cannot be saved, yet, if the treatment be given early enough, fresh leaves will be put out in time to help the tree perform its functions during the summer.

All fallen leaves about infected trees, and the shoots which are cut off when pruning, must be burnt, because in such harbors the spores live through the winter. Were the prunings left about they would prove a menace to other trees when spring came round.

—Agricultural Journal of Victoria.

Vegetable Garden.

OPERATIONS FOR APRIL.

By W. S. Campbell.

As good rains frequently occur during April, any heavy work, such as trenching and preparing for the planting of permanent vegetables, had better be carried out whenever time permits.

Asparagus.—This is one of the best of the permanent vegetables referred to above, and should be planted in the early spring. It will succeed in almost any part of the State where other kinds of vegetables will grow. In most unexpected places it may be found luxuriating—far away in the west, for instance—where sufficient water can be provided for its requirements. When preparing land for this vegetable, unless the soil is naturally rich, a good deal of manure should be used; that is, horse, cow, fowl, or sheep dung, either separately or mixed together.

Beans, Broad.—During the month these may be sown as extensively as may be required, for this is about the best time of year to sow. Sow in rows about 3 or 4 ft. apart, and drop the seed about 4 in. apart in the rows.

French or Kidney Beans.—It would be unsafe to sow any more seed of this vegetable, except in those parts of the State which are not likely to be affected by frosts.

Beet, Red and Silver.—Attend to seedlings which have come up, keep them free from weeds, and thin out well. Further sowings had better not be attempted until the spring.

Borecole or Kale.—If it be intended to make a trial of this vegetable, sow a little seed.

Brussels Sprouts.—This is one of the very best of the cabbage tribe of plants, and should be grown wherever the climate may be found suitable. It will succeed best in cool or rather cool districts. Endeavor to obtain seed only of the highest quality, as there is a great difference in the merits of different kinds of seeds; and although the price of the best may be higher than other kinds, it is well worth the extra cost to procure the best. Sow a little seed from time to time, and plant out any seedlings which are well grown and which have been pricked out for the purpose. Use plenty of manure when preparing the soil for the planting.

Cabbage.—Sow seed from time to time as extensively as may be required. but there is no necessity to waste any seed. Plant out any young cabbages that are well enough grown.

Cauliflower.—Sow a little seed during the month, and plant out with a good deal of care any suitable plants which are ready. Do not stint the application of manure. All the cabbage family are gross feeders and need abundance of good food if the best results are expected. Cauliflowers need to be grown well from the start, and on no account should suffer any check, or they may produce nothing but "button" heads.

Carrots may be sown as extensively as may be required in drills about 1 ft. apart. Drop the seed thinly and see that the seeds do not stick together. Thin out the seedlings well when they are large enough to handle.

Celery.—Plant out a few good strong seedlings in richly manured land. Water them well as they grow should the weather be dry.

Endive.—Sow a little seed. Plant out strong young seedlings as required.

Leek.—This needs soil that has been heavily manured. Sow seed from time to time and transplant the leeks when they grow to a height of 6 or 8 inches or so.

Lettuce.—Seeds of this vegetable may be sown as extensively as may be required during the month, and young lettuces may be planted as soon as they are large enough to move. They should be transplanted with care—lifting them so that as few roots as possible may be broken. The best way to manage this is to water the plants well, soaking the soil thoroughly before transplanting. Use plenty of good manure, and try to bring the plants on quickly.

Onion.—This is a good time in which to sow seed largely. Use manure liberally, dig and drain well, and finish off with as fine a seedbed as possible, and the more level it is made the better. Indeed, all vegetables will succeed best where the ground has been made quite level. Sow the onion seed in drills about a foot apart, and just cover the seed with fine soil. If pickling onions are required, sow seed thickly broadcast, preferring a white variety in preference to a brown or red. The white Spanish is an excellent mild sort, but the brown kinds keep best when stored for use.

Parsley—Sow a little seed of this most useful herb, and never be without a few plants.

Parsnip.—Sow a few rows in deeply dug soil. The parsnip is a very deep-rooting plant, and needs good preparation if good roots are required.

Peas.—Sow largely from time to time during the month in rows 3 or 4 ft. apart, or they may be sown in double rows, as is sometimes preferred. When the peas have grown to a height of a few inches stick in light brushwood or sticks along the rows, to enable the plants to grow to the best advantage.

Radish.—Sow a little seed now and then during the month to keep up a sufficient supply.

Shallots and Garlic.—Plant a few bulbs in rows, setting them about a foot apart in the rows.

Herbs.—Sow seed of any kinds that may be required.

Agricultural Gazette of N.S W.

The Vegetable Garden.

April should see a reversal of form in the surface arrangement of soil for winter and early spring crops. Plenty of water is necessary for vegetables even in winter, but the drainage must be more perfect, the planting more open, and the soil arranged to attract more heat than is necessary in summer time. Well raised and narrow beds, or lands rising in such positions as will allow of the sunlight falling on the largest possible proportion of the surface will ensure the soil being "quick" and suitable for winter cropping. Rank manures should not be placed in heavy or lowlying soils in autumn or winter. Such soils may need feeding badly, but the manurial dressing must be of a short or warming character; thus, well rotted and spent dung, ashes, or clean fibrous loam will attract more heat, preserve the soil sweeter, and is better able to support vegetable life in a low temperature. Clay pits can easily be made to hold liquid manure, and a few arum lilies or a shrub or two planted round keeps the spot sightly. Material from the stable, cowshed, pig-sty, and poultry run are all excellent, and go further if placed in a pit, where they may dissolve and combine such properties as ordinary garden crops can promptly take up. Crude dry manures may lie for weeks in a winter soil and do no more than prove a positive hindrance to root formation or extension, where the same material, if properly treated and given in liquid form, would lead to free, strong growth. A little lime, as well as bonemeal or superphosphate, should be added to the liquid manure pit or barrel occasionally, in order to make the dressing a complete one. Wood ashes, too, break down more readily, and are, therefore, of much earlier value if placed in a strong liquid manure. For economy, the pit or pits should be small and the contents fairly turgid, as here the waste by evaporation is less, and, further, the labor of distribution is less, as fresh water about the garden may be used for diluting whenever crops are dealt with.

—Agricultural Journal of Victoria.

THE GARDENER AND LANDSCAPE GARDENER.

Think over the lawn problems. Good taste is no longer in sympathy with dotting the surface of a well kept lawn with individual trees out of proportion to its real needs, with the result of breaking up its continuity, lessening its apparent size and rendering it more expensive to maintain. A few dignified specimens may be desirable, but groups, or masses, arranged with a double purpose of adding depth, or to serve as a framework to important vistas over the lawn, or the equally important service of acting as screens to objectionable views or divisions to various portions of the estate, constitute the best treatment. Shrubs, too, should not unnecessarily break up the lawn, but should be grouped, or massed, on the boundaries, or against the base of trees, masses often serving the double purpose of screen and ornament; again planting at the base of buildings may add much to their attractiveness—the grouping of the shrubs should be studied out with a view to making harmonious combinations of foliage and with an avoidance of spottiness. An arboretum of shrubs should not be attempted in a private place, but rather strive to make mass effects with due regard to the proper use of occasional selected individuals whose character should be emphasized. Do not overlook the advantage of using some of the vigorous perennials in such shrub borders; for instance, the silphiums, eulalias, helianthuses, and others, may be used more effectively in this way than in a strictly perennial border; and the blooming season of the shrub border can be materially lengthened thereby. Give the area of the lawn careful study, and limit the closely trimmed portion to the immediate vicinity of the buildings, or paths, or the strictly formal gardens; make easy transitions from this more expansive greensward to less frequently trimmed, less used lawns, and finally to a field condition on those portions of the estate where such would be in better keeping with the needs and uses. In such cases, improve the opportunity for the naturalization of hardy bulbs and wild flowers that would lend added interest at the spring season when such things are most appreciated. How many of you apply your old bulbs to this purpose, or, better still, buy an inexpensive class of bulbs for this purpose alone? You can well put much study into all these lawn problems and the questions of shutting out objectionable views, retaining distant vistas, viewing the same lawn from distant and varied points, making properly framed glimpses between tree trunks under their canopy of foliage or through their branches, and many other such details, comprise the very essence of the highest types of landscape gardening.

A vast improvement has been accomplished by abandoning the meaningless fancy beds cut into the lawn, destroying its continuity; their use is properly relegated to one spot, perhaps adjacent to the house, or, better, in a formal garden set aside for that purpose. How much better to carry the eye over an unbroken turf to the lawn margins made interesting by shrub, herbaceous or tree borders, than the incongruity of placing meaningless geometrical beds in the foreground to such an interesting picture.

The formal garden frequently is a most important feature of a place; but its size, situation, and effect is a serious problem. It is difficult to maintain a constant flower effect therein. It is the most expensive form of gardening. It should usually be adjacent to the residence and form really an outdoor apartment of the home. Its interest is as much centred in its formal design as in the details of its make-up, and unless it is particularly good the disappointments may be serious. Be careful, therefore, in recommending such a feature, unless you are convinced it may be harmonious with the surroundings, reasonably demanded, and that the expense may be justified in the results gained.

The herbaceous border is here to stay. It should be extended to the full requirements, as in addition to its ornamental value, it is a very economical supply of cut flowers. But use great care in the selection of varieties, as in the long lists offered there are many kinds that are better adapted to naturalising or grouping in the shrub borders or elsewhere, than to being placed in the herbaceous border proper. The various forms of the European columbine (Aquilegia vulgaris) are all good herbaceous border plants, but our native species Aquilegia canadensis shows to far better advantage in its natural positions in the crevices of rocks, in ledges, and moreover is more permanent here than in the border. Many native asters are very much more effective naturalised in the woods, or encouraged in wilder portions of the estate, than they are in the border; and it is far better that they and such other gross feeders as the better types of golden rods and knotweeds be so planted that this drawback may not affect their neighbors. Other perennials of so-called miffy nature can be very successfully cultivated provided you give them the natural conditions of perfect drainage, sun exposure or otherwise meet their requirements. Edelweiss (Leontopodium alpinum), the gromwell (Lithosperum prostratum), the gentianella (Gentiana acaulis) are, with a long list of other examples, plants requiring this special attention to attain the greatest success.

The herbaceous border itself must be carefully thought out as to the subjects used and their grouping. Study the avoidance of spotty planting above all things, but do not forget foliage combinations as well as flower harmony of color, and do not depend absolutely on perennials in such a border, otherwise there will be a monotony in the repetition of the same effect from year to year. Use annuals and tender plants in liberal quantities to vary each season from another; moreover, a perennial border without a proper background seldom shows to the best advantage.

In naturalising, large masses are generally essential for best results, but this use of perennial bulbs and herbs is a fascinating study to yourself and your employer, making it possible to give great charm to portions of the grounds that may have been previously neglected. Without considering bulbs now, think how attractive the moist situation may be made with the introduction of colonies of the ever-blooming swamp forget-me-not (Myosotis palustris semperflorens); a large clump of the Gladwin iris with its yellow flowers; spreading masses of Lysimachia clethroides. To what advantage a dry waste corner could be improved with the plume poppy (Bocconia cordata) or the giant knotweed (Polygonum cuspidatum), both of which you would not dare to plant in the rich soils of the garden; but really I must break away from this line of thought to take up others.

Rockeries are dangerous features to fool with, but if you know how, can be made most interesting features. Aside, however, from the danger of error in their structural details is that of introducing them at all if they are not in harmony.

The vegetable garden can usually be improved upon, and at times may be made an ornamental feature of the place. Where else could you raise to better advantage gladioli, lines of bachelor's buttons, and numerous other cut flowers, and where more easily cultivate them? And is it not important that the flower display elsewhere should be free from the otherwise heavy house cutting demands?

[To be continued.]

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The Flower Garden

OPERATIONS FOR MAY.

All beds and borders should be hoed and raked to make them neat for the winter. The pruning of shrubs and the clipping of edgings may now be done. Hardy plants of all descriptions should be put in at once. Plant hardy annuals of all kinds, and sow seeds for successive lots. Plant hardy bulbs at once. Edgings of box, thyme, rosemary, fairy rose, and lavender may be put in, using either rooted plants or cuttings, the latter being quite as reliable as the rooted if made six inches long and planted within two inches of the tips.

Divide and replant at once violets, primroses, perennial phlox, penstemons, agapanthus, and other herbaceous plants. These all delight in rich soils, and should be well mulched with short, decayed manure. Sow and plant out all hardy annuals. Plant evergreen trees and shrubs at once, watering well as soon as planted. Prune, manure, and dig around roses. A few plants of the tea varieties may be left unpruned for autumn flowers. Continue planting hardy bulbs and tubers, such as anemones, ranunculi, snowflakes, nerines, hyacinths, and gladioli. Put in cuttings of verbenas, petunias, pelargoniums, lobelias, cupheas, &c., for planting out in the spring. Mark the best chrysanthemums for propagation whilst in bloom. Prepare ground at once for tree and shrub planting, manuring liberally where the soil is poor. Deciduous trees and shrubs may now be pruned, leaving evergreens until midwinter. In pruning dwarf roses all old stems should be cut out, leaving only those of last season's growth.

THE GARDENER AND LANDSCAPE GARDENER.

[Continued.]

These hints may serve as suggestions as to how you may practise practical gardening; and, moreover, you may find this the solution of the problem of expenditures whereby you are producing the maximum of results with a minimum of cash—a strong factor of appeal to your employer.

Do not allow the tendency to follow paths of earlier training all your days prevent your varying your methods or ideals. If not adapted to your present needs or the requirements of your employer, doubtless this earlier training was fully up to date those times; but with new methods and new ideals you must give such careful attention and apply them to your personal use. Immense strides are being made in horticulture; the painstaking methods of the old gardening training of the European countries is excellent in the same way that the study of botany is excellent training, even if in after life you make little application of the technical knowledge. No country at present is advancing in horticulture as fast as this, however, especially in the line of new investigation. It is true that much time and money have been spent by the experiment stations and the Government departments in lines that have seemingly been a waste. It is not easy for the college professor to abandon theory for practice; yet we are hardly in a position to criticise him for his accurate investigations which are bound in the long run to tell, and already far-reaching results are being accomplished. Pure mushroom culture is a recent and very important result; nitro-culture will prove of far wider importance. Fertiliser investigations, the study of soils, irrigation, and forestry; the remedies for plant diseases; the control of insect pests—all are very largely attributable to Government effort, and this knowledge is yours for the asking. All are indirectly or perhaps directly connected with landscape gardening.

Another problem is that of the greenhouse or conservatory on a private place. Is it not true that in many ways the expense involved, its detraction from giving attention to other problems, is disproportionate to results obtained? Every one loves flowers in winter; they are a necessity, but is there not a tendency to devote too much expenditure to this feature? Are the conservatories visited by the owner as frequently after the second year as before; does his or her interest keep active, or is it true that after a time the expense of maintenance becomes a burden to the owner, and may it not lead to a feeling that results hardly warrant the cost, and perhaps to the undoing of the gardener? If the owner's interest is centred in the conservatories, that feature may become the dominating one, though there would be a question even then, if the estate does not have opportunities for development which the owner may not have recognised, and which, it is your place to be able to take advantage of and encourage to the owner's pleasure and appreciation. Greenhouse work is tantalising, imperative usually, and I by no means wish to discourage it; but I do wish to show that it may be fatal for you to neglect your outside opportunities. If you have your work so well under hand that the greenhouse in no way interferes with your making the most of your opportunities, little criticism can be raised; but, on the other hand, if the use is that of producing plants for bedding effects that had better not be attempted on the place under your care, then that use of the greenhouse should be changed. Is it not worth your while to make the most of your opportunity to study better and more varied effects in the greenhouse also? Conservatory treatment is subject to the same criticism as the treatment of the ordinary estate; i.e., that of too much monotony. The regulation palms, cycas, dracænas, rubber plants carried to that extent that nine times out of ten a list may be made in advance of what is to be seen in an unvisited conservatory, tends to destroy interest. Introduce some unique things, study better displays of what you have in far greater variety. Take advantage of the suggestion made a few years since by the Bussey Institution at the annual spring exhibitions of the Massachusetts Horticultural Society of forcing native or introduced perennials and shrubs. No greater expense may be necessary to do this, and the interest in the gardener's work will be perennial with the owner.

The problem of your success in your profession, therefore, is that of your willingness to study and think and work, to take the utmost advantage of your opportunities presented in the problems under your care, and to apply the fundamental principles of landscape gardening, i.e., good taste, so persistently as to convince your employer of your indispensable qualities, which is the measure of value in every line of effort.

—"Florists' Exchange."

GARDEN EDGINGS.

In large grounds where borders and flower beds are cut in a wide expanse of turf but few edgings are needed, but in the average garden they are a very important feature, though so frequently neglected. In the majority, particularly in the country, a grass verge is employed. Anything more unsuitable, troublesome, and generally inartistic it would be difficult to find. It is usually from 1 foot to 2 feet wide, the width being largely regulated by the blades of the mowing machine. The unsuitableness of this grass verge lies in the fact that, owing to the constant necessity for mowing, rolling, and trimming the edge, all flowering plants must be kept nearly 6 in. away from the edges of the beds, so forming a hard line; also the grass gets soiled during gardening operations in the winter, and in summer it is often brown and worn from being walked on, unless the plan of putting iron hoops a la public gardens is adopted, a veritable cause of stumbling to the unwary. If there were grass verges to the long, narrow beds that form my rose garden, there would be a little over a mile of grass edging to mow and trim every fortnight. Certainly, no one can claim any beauty in a narrow strip of more or less ragged turf set flat between a flower bed and a gravel path. Even where the turf is beautifully kept, close as velvet and with edges true, it is at a cost out of all proportion to the resulting effect. Of course, some of these drawbacks apply to beds cut in turf, but here the effect is better; besides which, when it is all grass, people do not walk in one place, so that it is not worn, and one presupposes a large enough staff to keep it in order and to see that the edges are not "broken down" by being trodden on. Whilst speaking of this most unsightly result of treading on the edge whilst soft, it is not every gardener who knows how to repair this quickly and well. Instead of cutting out the crushed section and adding mould under it, lift the edge without cutting the turf, with a sharp spade slipped under flat, and insert a wedge of any old piece of turf cut to the size required. A pat or two with the spade will settle everything in place again, and there is no fear of sinking, like there is with loose earth, and, more important still, the edge is firm turf. Box edging has nothing to recommend it, save "ancient use;" it is very troublesome to keep in order, as it shows a great inclination to die out in patches, and it soon grows bare at the base. Besides being a fine harbor for vermin, it is a nursery for weeds, particularly for couch grass. It also is a robber of the soil, and practically hides all low-growing things behind it, and is stiff and formal. It was only in its place when Italian gardening was in vogue. Ornamental tiles are impossible, besides not fulfilling the prime necessity of being permanent, as they are easily broken, and the frost causes them to crumble. The only ornamental, useful, and cheap edging is formed by evergreen creeping plants growing over a stone edging that, once set, is no more trouble. Any stone will do. "The stone of the district," say the few writers on the subject, "sandstone blocks for choice, but on no account use flints, bricks, or clinkers." No one would who could get sandstone, but the question of expense rules the garden even more than elsewhere, and in a chalk district flints are the only stones available. These soon lose the raw, new look, and though they do not absorb water, they, at any rate, do not crumble. Bricks are bad for this reason, still they have the great advantage of taking up moisture like a sponge; a 4½ lb. brick, put into a pail of water for some hours, will weigh 9 lb. In a hot, dry position this is an advantage, as all moisture is absorbed, to be returned to the plants during heat. Clinkers are the last choice, but even these can be made possible by dipping them into a mixture of color-wash with some sand in it. A dull red—the tone of red sandstone—is the best. If the edging is properly planted and well looked after there should be but little of the stone showing in from six to twelve months, so, if either of the last two must be used, the unsightliness will be but for a short time. Where well-shaped blocks of sandstone can be used, of course no one would try and quite cover them; but not so with "makeshifts."

What ever is chosen or used must be used with a real knowledge of "why." Quite two-thirds of the stone should be sunk in the ground. The reason for this is not so much firmness as to make a cool root-run during hot, dry weather, and a protection against frost and excessive moisture in winter. Sandstone makes an ideal stone for rock plants, as it holds a great deal of moisture, drawing it from the ground even in summer. The Sandworts are quite independent of soil, if there is any sandstone for them to grow on; the lesser Saxifragas are the same. The best time to set the stone is when the bed is made, but if this is in situ, dig a narrow trench between it and the path, rather deeper than the stones are to go. Put in the bottom 2 in. to 4 in. of good gritty earth, setting the stones on to this, letting them vary in height from 2 in. to 6 in. above the level of the bed. At this time they should touch, or, failing this, a small bit of stone must be wedged at the back, otherwise the mould will wash through during heavy rains. Well ram some more of the gritty earth round the stones at the back, and some fine gravel in the front, or path side even though there has to be a gutter, this care being taken because of the plants, which will push their roots down amongst the deep-laid earth under the stones, finding there, in even the hottest, driest weather, coolness and moisture;

and as so many creeping plants throw out roots from their branches, if they get amongst ground that they like, it will be found that they will root into the fine gravel very freely, so keeping themselves secure over the stones.

The plants that are suitable must of necessity be regulated by considerations of soil, climate, and position, besides the all-important one of expense. Where dressed blocks of sandstone are used, "border gardening" becomes a pleasure, second only to good "wall gardening," and is more than enough to occupy the leisure" of even an energetic amateur, for in a large garden these edgings are measured by the mile, my before-quoted rose garden having over half a mile, yet I count it small. To the much-to-be-envied owner of such stone edgings all things are possible. To the best of encrusted Saxifragas, fragile mountain pinks, rare primulas, colonies of Ramondia pyrenaica alba, lovely drifts of phlox, there is no limit. There is no necessity for covering up all the "stone." Foremost come pinks. Their soft grey-green foliage looks like bloom during the winter, and their flowers are ever welcome. Somehow I have become possessed of a pink that is really marvellous. The "grass" is nearly as strong as in Carnations. In November the wide belt is white with big flowers like a perfectly grown Mrs. Sinkins, a tinge of green at their heart. December transforms them into a white flower with faint red markings, but April finds them Carnations! I mean they go steadily on, flowering all the summer, but when the cool rains come in March they throw up 15-in. to 18-in. stems with six to twelve flowers. On October 20 I gathered a handful of perfect blooms. I simply dibble in the cuttings 2 in. apart, about March, as close to my flint border as I can. A year after the stone is hidden by a 12-in. wide belt. I have a run of 150 ft. of this pink. All of the Dianthus family are beautiful. Nearly all of the Saxifragas are good, but the Mossy and London Pride sections are the most useful. Of the former, S. trifurcata (the Stag's Horn Saxifraga) is, perhaps, the best, the old London Pride being hard to beat. Where a wide border is wanted the giant-leaved Saxifraga (S. crassifolia) is unrivalled, as any one who has seen it at Mentone will agree. Double primroses, aubrietias, auriculas, primula denticulata, violas (the American vars., such as V. pedata and V. cornuta, tufted pansies, Veronica rupestris, the double white Arabis, Lithospermum prostratum, phlox, hepatica, sedums, sempervivums in variety, and Gentians are a few of the best. Not every one has seen the violet "California" as an edging miles in length. I saw it once, and have never forgotten it—an enormous orange "grove" a couple of miles above Nice, the trees planted in large oblong beds, each with a foot wide border of this violet in full bloom. Where a wider border is needed for shrubberies, the various ivies, gold and silver leaved as well as the plain, are good, particularly for cool borders, when Snowdrops are beautiful planted amongst the Ivy. Where a little trouble is not objected to, various half-hardy or deciduous things can be used. As an illustration, large pink oxalis for the summer, with Myosotis dissitiflora for winter and spring, or anemone and dwarf nasturtiums. Dwarf bulbs make good edgings. All the scillas, chionodoxas, crocus, "species" hyacinths, and the muscaris, triteleias, sparaxis, sternbergias, and autumn crocuses are a few. A good edging for a sunny shrubbery is yellow alyssum, with either parrot tulips or Spanish irises planted amongst it. Thrifts and Sweet Williams are good. For a fruit garden alpine strawberries and violets are among the best, and the thymes for the kitchen garden.

A. BAYLDON.

Dawlish, S. Devon.

HARDY PERENNIAL SEEDLINGS.

There is no more interesting work than the growing of hardy perennials from seed. To the man who handles a great number of different kinds it becomes very absorbing. To the untrained eye, with seedlings in the cotyledonous state, one kind is very much like another, yet to the expert they are as easy to distinguish as the plants when in a more advanced stage.

Many peculiarities may be observed during the germination of different kinds of seed. Iberis sempervirens gives off a very disagreeable odor, not unlike that of boiled cabbage in an intensified form, which gradually disappears as the seedlings appear above the ground. Penstemon Digitalis, along with some of the other species, has a peculiar and distinctive odor which is very pronounced at the time of germination. It is no doubt caused by a chemical change taking place at that time similar to that which takes place when barley is malted, and leads to the thought, how many unknown products are there still to be discovered that my be of value?

With delphinium seed, there is always a mold that makes its appearance during germination on the top of the soil before the seedlings push through the ground. At first this used to cause me annoyance, as it was thought to be a fungus in the soil, but from close observation and many experiments, it is proved to be always present with the germination of the seed, and is not necessarily detrimental.

The majority of seedlings rapidly push up the seed leaves, or cotyledons, clear of the soil and spread them out horizontally, while others remain very close, barely forming any stem. The gaillardia is a good illustration of this. The seedlings seem to have barely enough strength to push through the soil. Perhaps the hot, dry winds of the western plains, where they are native, have taught them not to be too previous. There is some natural cause for every variation, even though we pass the matter by, thinking it their nature so to be.

The actual pricking out of the various kinds of seedlings is a very simple matter, best by the artificial method above stated. but at the same time it pays to do it right. The boxes should always have sufficient crevices to ensure good drainage. If tightly made, when the wood becomes wet it swells and will often makes the boxes watertight. dry and have a good proportion of sand mixed with it. If about 1 in. of well rotted manure, such as that from a spent mushroom bed, be spread over the bottom of the box, it will help maintain an even moisture in the soil and prevent the fine soil from washing through the crevices, besides being good for the plants.

In filling the boxes, press the soil down evenly round the sides, so that an even surface will be maintained after it has been watered. Pricking out is rather a tedious job, especially if the seedlings are very small; but with practice a boy soon becomes expert. Keep the plants in rows, even if only planting an inch apart, as it may be necessary to surface the soil if it should become baked or green, and it will make the weeding of them much easier. Weeds are never too small to pull out; if left too long, this cannot be done without uprooting the plants.

ERNEST HEMMING.

GOOD ROOM PLANTS FOR WINTER.

Amateurs are always inquiring the names of a few good room and window plants, particularly for the winter, when flowering ones from a greenhouse seem to quickly fade. One reason of so many failures is that they are bought from barrows, and these plants are forced in heat to make them sell. They look in the perfection of health, but, so to say, possess no stamina, and the change from the hothouse to the dwelling-room is too great.

The Parlour Palm (Aspidistra lurida variegata) is one of the best of all room plants, and stands first in my selection. The reason is that the leaves are leathery, and practically impervious to dust. The flowers are very curious, not attractive, and produced on the surface of the soil. Loam mixed with peat is a good soil, and provide good drainage. After potting stand the plants in the greenhouse if possible to assist them to become more quickly established. A great fault is constantly repotting plants, which is not required. As a rule, in the case of such things as these, the less they are disturbed at the roots the better. A great check is imposed by his constant disturbance, and they never increase properly. It is essential to sponge the leaves frequently with tepid water to remove dust and dirt from the surface. Once a week at least this should be done.

India-rubber plant (Ficus elastica) is the next best room plant for winter. It is not so useful nor so vigorous as the Aspidistra, as there is a certain objectionable stiffness about it, but if often thrives where it is impossible to grow flowers. A good loam and peat soil and a moderate amount of drainage must be given. But the most important thing, as in the case of the Aspidistra, is to sponge the leaves at frequent intervals to remove dust and dirt. When the foliage begins to turn yellow a little soot-water will be beneficial, but there is really little attention required, simply not to overpot or repot too often, and water very carefully during the winter months.

The Orphiopgon is another good window or room plant, though usually kept in a greenhouse or conservatory. But it may be brought into the room, and its wealth of narrow green and creamy-white variegated leafage is very attractive, especially when set off by spikes of sapphire-blue flowers. It grows freely in an ordinary lomy soil, and when used in the greenhouse is very pleasing in a terra-cotta vase or window-box, so to say, on a greenhouse shelf.

Three excellent ferns for rooms are Pteris cretica, its variety albo-lineata, and P. tremula. I do not think it is possible to get a more useful trio, all being so vigorous, and not like the majority of ferns, averse to cultivation in rooms. They succeed in ordinary peaty soil, and greatly dislike an over-supply of water. Dracæna Indivisa is another useful plant hard to kill, and always fresh in aspect when the foliage is kept properly sponged, and to this small selection may be added the Date Palm, Corypha australis, Grevillea robusta, the Norfolk Island Pine (Araucaria excelsa), very pretty when small and distinct in aspect, and the Sedge (Cyperus alternifolius) and its variegated variety, which require more moisture than any of the other plants mentioned. It is graceful, free-growing, and pretty when stood on a small table so that its fanciful growths is in no way cramped. All the foregoing kinds I have grown for years in rooms, and during the winter especially they succeed better than anything else I have tried.—T.

A FINE WINTER-FLOWERING PLANT (EUPHORBIA JACQUINIÆFLORA.

Next to the Poinsettia, the Euphorbia is one of the brightest subjects we have for this season of the year. It is rather more difficult to manage than the Poinsettia, as the slender roots are liable to perish if allowed to become dry or if kept too wet. It is very important to have strong cuttings, and this can only be done by looking after the old plants after the flowers have been cut. When flowering is over, the plants are somewhat shabby-looking, and on this account they are often consigned to some obscure corner and neglected. The earlier in the year cuttings can be had the better. If taken off close to the old stem with a slight heel, and inserted in pots filled with peat, leaf-mould, and plenty of sharp sand, and stood in a propagating case, they will soon form roots. I like to put the cuttings singly into small pots, as then there is no danger of the tender fibres being injured in any way. When ready for potting off, some loam and a little manure may be added to the mixture just mentioned. Early-struck plants may be stopped once or twice, but those rooted later in the season may be grown three in a pot. This Euphorbia must not be ripened off; the more freely the plants are grown, the longer will be the sprays of bloom. When required only for cutting it may be planted out with advantage, especially if a position where there is a little bottom-heat can be given. Give the plants plenty of drainage, using a rough, porous compost. It must be well exposed to the light, and with good treatment will stand full exposure to the sun. In the summer artificial heat is not necessary, but as soon as the nights begin to get chilly a little fire-heat must be applied. If left in a cold-house, the mischief will show itself as soon as placed in heat, when the leaves will quickly fall, thus spoiling the appearance of the plants.—T.

THREE GOOD WINTER YELLOW-FLOWERING PLANTS.

Yellow flowers are not plentiful at this time of the year; yet anyone having an ordinary greenhouse or a cool conservatory may without any difficulty have a grand display of Abutilon Golden Queen and Linum trigynum, and wherever the temperature of a house can be kept at a minimum of 60 degs. during the winter, a third plant, the lovely Linum tetragynum, may with advantage be added to the list. Little need be said here about the Abutilon, as other varieties with flowers white, pink, and red of various tints are well known and found in nearly every private garden where cut flowers are in demand during the winter. There, under a generous treatment, and planted out in the border of a greenhouse or of the conservatory, either against a wall or as pillar plants, they produce in great abundance their lovely flowers, which are so well adapted for bouquets and table decoration.

Abutilon Golden Queen is a great improvement on the better known Boule d'Or, being of better habit and a much more profuse bloomer. Its beautiful bell-shaped flowers of a bright yellow colour are produced from the axils of the leaves at nearly all times of the year. Abutilons are easily propagated from cuttings, which root freely at almost all seasons, although those struck in early spring are the best. They may also be considered clean plants, the only insect to which they are subject being the green-fly, which is readily destroyed either by fumigating or by syringing the plants, especially the underside of the foliage, where the vermin generally collects, with a weak decoction of Quassia chips, which leaves no unpleasant smell and is very effective.

Linum Trigynum is the popular name for Reinwardtia trigyna, a neat-flowering plant of shrubby habit, native of the mountainous parts of the East Indies. Although of equally easy culture, this plant requires a little more attention than the foregoing, but at this time of the year its flowers, of a rich orange-yellow colour, amply repay the cultivator for any extra care bestowed upon it. Linum trigynum is essentially a greenhouse plant, and does best in pots. It is easily increased from cuttings made in March and April, and these, if properly treated, form in the course of the season bushy, well-furnished plants in 4½-inch pots, which during the winter greatly assist in the decoration of the greenhouse and conservatory. The shoots from plants which have been cut back soon after they have done flowering form the best cuttings, which should be inserted in a sandy compost and kept in a close propagating frame, where they root readily, after which they should be potted singly in a mixture of fibrous loam, partly decayed leaf-mould, and silver sand in equal parts. To ensure free growth it is advisable to add a small quantity of some fertiliser to the above-named compost. When rooted, and until they are fairly well established in the pots in which they are to flower, the young plants benefit by being kept in an intermediate temperature, while in autumn a position in a low frame to which plenty of air and sun can be admitted is best, as it is necessary to ripen the last-made wood to favour the formation of the flower-buds. During their growing season the plants must be frequently pinched to ensure their growing into a compact shape. The last pinching, however, should take place not later than the end of January, or there is a danger of not allowing sufficient time for the formation of the flower-buds, especially if it should happen to be a rainy season. A temperature of 50 degs. to 55 degs. is that in which the flowers open best and are least likely to damp off. On account of its being subject to red-spider, Linum trigynum must be frequently syringed, and care should be taken that the water reaches the under part of the foliage. During the hot weather, from December to March, when the plants are best stood outside altogether, it is advisable to give them three or even four syringings a day, preference being given to rain water whenever procurable. After flowering, the plants may be cut back and subjected to similar treatment, but it is preferable to propagate and grow fresh plants every year. If not pinched, Linum trigynum forms a straggling, unshapely bush, varying from 2 feet to 3 feet in height.

Linum tetragynum is another beautiful yellow flowering plant of shrubby habit, but it must be grown in a warm house all the year round. If we only judge by the outward appearance, we find that it has a great affinity with the plant just described; indeed, the differences are mostly botanical, inasmuch as its flowers, as the specific name tetragynum implies, are four-styled; whereas those of L. trigynum are three-styled. As a decorative plant for winter it is of as great value as the other; its flowers, which are produced in greater abundance, are disposed in large fascicle-like racemes at the summit of the branches and branchlets; they are of a very pleasing pale primrose-yellow colour, and often 1 inch in diameter. The plant is sometimes literally covered with its delicate Convolvulus-like flowers. The propagation of Linum tetragynum is not limited to cuttings only, as this pretty species produces underground suckers, by which it may also readily be increased.

SMALL ANNUALS IN POTS.

The effect of the cold conservatory during summer can be considerably beautified by the use of annuals grown in pots, as we all know; but I want to put in a plea for the pot culture of some of those small subjects that are scarcely ever seen except in beds and borders where annuals are extensively cultivated.

Schizopetalon is a charming half-hardy annual to begin with; the tiny cruciform cream flowers are deliciously Almond scented. Seeds of this, as of the other plants to be mentioned, may be sown ½ in. apart in the pots direct; then, if the soil is rich and sweet, no pricking out will be needed, only judicious watering and the occasional application of weak soot water. The pots should be glass covered directly the seed is sown, and should stand on a sunny window sill.

Nemophilas and Lobelias are known to all. Kaulfussias are good for this purpose; K. amelloides is the blue, K. atroviolacea the purple, and K. Kermesina the carmine variety. Alyssum maritimum, the dwarf, white Sweet Alyssum, will be popular for its honey sweet perfume. Arctotis breviscapa will give orange flowers in sunshine, so pots of it will prettily adorn a sitting-room window ledge, and the blue and the white Campanula Attica are my own favorites for dinner table ornamentation.

Clintonia pulchella, blue and white, and alba, white; Collomia coccinea, sherry scarlet Godetia Bijou, a white, dark spotted variety that only grows 6 in. high; Ionopsidium acaule, white and violet, 2 to 3 in. high; Leptosiphons of all colors; Limnanthes Douglasii; Mesembryanthemums of several varieties; Oxalis rosea; Polygonum capitatum, pink, 3 in. high; Sanvitalia procumbens, yellow; Saponaria calabrica, rose, and S. alba; Silene pendula compacta, pink; ditto Empress of India, crimson with purplish foliage, and S. p. c. alba flore pleno, a 6-in. double white. Veronica glauca, royal blue, and Portulacas of various hues can all be recommended for pot growing, so afford ample choice.

M. Hawthorne.

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A PLEA FOR THE HARDY BORDER.

By Herbert Greensmith.

It would scarcely seem necessary to call attention at this early season of the year to hardy perennials; they are so beautifully tucked away, in many cases, deep under the snow, needing no thought or care of ours; but the time of the singing of birds is at hand, and the glorious long looked for spring resurrection is rapidly drawing nigh. Are we ready for it? What about that show or sample bed of hardy plants which we can invite our prospective customers to look at? There is much more satisfaction in buying when one can see what he is getting than in purchasing from a catalogue of bewildering names. Have we decided to plant that unsightly corner, which is perfect in its adaptability to many hardy plants, and to make it a thing of beauty by a judicious embellishment with these ever-increasing popular plants? There is a great campaign of educational work to be done along the line of growing herbaceous plants; who is to do it? The opportunity lies at the door of every progressive American florist. He can and must be the instructor.

Many wide-awake florists are already entering the field, and others are in search of information, enquiring what is the best and most feasible way to get at it. I would emphasize the suggestion made above—have a bed or a corner of some kind neatly and decently laid out, containing, if nothing more, a few of the choicest kinds: Rudbeckia Golden Glow, Helianthus multiflorus, always useful, but well known. Day lilies and the more common kinds I would exclude if room is at a premium, because they are well known, and as occasion requires, are cheaply and readily secured. But where space is available, plant them by all means, as they are among the most saleable stock.

Isolated forms of many herbaceous plants make but a poor impression; therefore, bold grouping is necessary to be effective. Lychnis, stokesias, arabis, candytufts, isolated plants of the dwarf phloxes and others of similar nature and habits are never so effective or impressive as when massed. Of course, the taller and more robust growers, such as boltonias, heleniums, some forms of asters, rudbeckias, chelones, &c., are all right in fair sized clumps; but even some of these show up to better advantage and produce both larger heads of bloom and larger individual flowers by yearly division. Both asters and heleniums profit by it, and I am persuaded I get more satisfaction out of a single crown of Helenium autumnale superbum than I would out of a large clump, a foot across. With some varieties of helenium, the reverse is the case, as, for instance, H. Bolanderi and H. pumilum; both are apt to be dwarfer and not so floriferous if closely divided every year, and, in many cases, if allowed to stay over two seasons in one place they are likely to be entirely swept away by fungus.

Speaking of heleniums, which we are very liable to associate with fall flowers, I should like to call particular attention to H. Hoopesii. I should think this is one of the prettiest and deepest colored sorts that grow, and, quite contrary to its congeners, it blooms in early June, and in good soil has flowers two to three inches across, of a lovely orange-yellow shade. Very often it will produce a second crop of bloom toward fall. The great beauty of this plant is that it can be so easily raised from seed, which, if sown inside in January or February, will produce some bloom the first year in very late fall. But the plant will not be at its best till its second season. It grows about 2 ft. high, and being of such a bushy habit, can be planted close. It is also very useful for cutting, and this is a factor which should not be overlooked, especially where room is limited, for a double purpose is thus gained.

One great obstacle to overcome is, how best to serve this double purpose, for so many hardy plants are not good subjects for cut flowers, and, again, so many people believe that all or nearly all of this class of plants bloom in a bunch toward the autumn. A greater mistake never was made, for they are the first flowers to come into bloom, not in early spring, but even in winter. In favored locations now in our snow-bound North, the Eranthis hyemalis, or winter aconite, is in flower; as is also Petasites fragrans in the western part of New York. This plant used to bloom with me in February, but the flowers got damaged by heavy frosts. With the protection of a frame, however, this difficulty could be overcome. The chief beauty of the plant lies in its sweet, delicious, heliotrope-like fragrance, which is very pronounced, and lasts well long after the flower is cut.

I am not quite sure but a great many of us would be delightfully surprised if we were to go out and dig down under the snow and leaves even now, and there find signs of life already at hand. We would see that the plants are getting ready for their spring work. Where the ground is not frozen too hard, they are actually making root and pushing up their leaves, buds, and flowers. Last year the Japanese coltsfoot (Petasites japonica gigantea) actually worked up its flower heads through the frozen ground and ice, and flowered early in March. On February 26 two years ago the Japanese Joss flower, Adonis davurica, without any protection, came into bloom while the ground was still hard frozen. Last winter being more severe, it opened its blooms on March 11, with a slight covering of snow still on the frozen ground. I have seen Symplocarpus fœtida, common in our meadows and swamps, do the same thing. Of course, the flowers of these are not of much real value to the average florist, but these remarks only go show that hardy plants, by judicious selection, may be had in bloom every month in the year.

To say just what should or should not be planted in a sample bed or border would depend very much upon the space and situation. The border might be alongside a fence, a wall, or building; then, of course, select tall-growing, showy, useful plants for the back of the border, and the more dwarf ones for the front and intermediary rows. Neither would the writer, even in a limited space, confine himself strictly to those varieties exclusively useful for cutting, as, for instance, the early flowering phloxes or moss pinks, the arabises, the cerastiums, armerias, dwarf lychnises, epimediums, and the beautiful little houstonias, always quaint and much admired, even prettier than a forget-me-not. The early-flowering anemones, the Alpine asters, various iberis (candytufts), Omphalodes verna, some of the dwarf veronicas, &c., are all very useful, showy, neat and attractive, and among the most desirable of our early spring flowering plants. All are suitable for the border, for edging of beds, or planting on the rockery.

The open border could be somewhat varied in planting, the subjects being studied as to height, which is generally given in the various catalogues, and period of blooming, and so placed or grouped in the bed that it would have the appearance of always having something in flower. The taller and more robust forms could be placed in or toward the centre, but some varieties, such as delphiniums, salvias, gypsophilas, valerians, lychnis, and other plants of a similar nature, which only have the appearance of being tall when in bloom, could be placed with good effect almost on the outer edge. As soon as their flowers commence to fall cut down the plants, and you will again be rewarded with a later crop of blooms. This would also break up any set or formal method; but the arrangement of planting will work itself out only by years of patient toil. While the plants are in bloom, their habits and positions can be best studied and their proper places determined my the æsthetic taste of the grower. No hard and fast lines can thus be set, for when we think our border perfect something always crops up whereby we may again improve it by some slight changes.

Bare spots in the best arranged border will occasionally occur. They occur in nature. Have you not noticed how quickly some of our native plants respond to the first warm, genial, rays of spring? For instance, the trilliums, or wake robins, the delicate American cowslip (Mertensia virginica), saxafrages, Dutchman's breeches (Dicentra cucculata), Anemone thalictroides, A patens nuttalina, the blood root (Sanguinaria canadensis); and where is there a more chaste or delicate spring flower, white as the driven snow? Why is it not more seen? Many others might be enumerated, but the above will suffice to illustrate how quickly they come and how rapidly they disappear.

When their flowering period wanes, and they begin to show signs of going to rest, have a few hardy annuals coming on, in pots, or in a separate border. If in the border, have them transplanted a few times to make them stocky and give them more roots. It is a well-known fact that many annuals, like trees, are apt, if not transplanted, to grow to one single root; these can then be dropped at will into the border and thus fill up any vacancy and add brightness and cheer to the otherwise vacant spots.

MIGNONETTE IN POTS.

Every lover of this fragrant flower does not possess a piece of ground whereon to sow seeds and raise plants; but they may grow some plants in pots; and I will briefly explain how to proceed. Fill some 5, 6, or 7 in. pots with a compost of loam, leaf soil, and sand; if these ingredients are not to be obtained, gather up some road scrapings, preferably from the sides of the road near to the grass. Put some cinders in the pots to ensure good drainage, make the soil fairly firm and use it in a moderately dry state, as it would not do to press down wet earth in the pot. Sow a few seeds on the surface, and cover them with a thin layer of fine loam. Give water through a fine rose and keep the pots in a light, fairly cool place. It is not wise to place them in a hot corner, as the plants would soon get scorched up. Thin out the plants to three in each pot, and when they are 3 in. high pinch off the top of each. Side shoots will then grow and quickly convert what appear to be scraggy seedlings into fine bushy plants, which will thrive either inside a dwelling house window or on the sill outside. Crimson Matchet, Bismarck, Miles' Spiral, and Victoria Improved Crimson are splendid for pot culture.

SOLENT.

THE ROSE.

("The Florists' Exchange.")

ROSES: THE NEW AND PROMISING VARIETIES.

(Read by P. J. Lynch before the Philadelphia Florists' Club.)

Your club has ever been in the front rank in furthering the popularity of the rose, while the fame of your growers is world wide. For a slow town like Philadelphia, sending safely to England's Queen, as one of your growers did, a bunch of that beautiful rose of Philadelphia origin, Queen of Edgely, savored of a pace rather difficult to overtake. Then, too, while the origin of the ever popular American Beauty (or, as has been claimed, Mme. Ferdinand Jamin) is somewhat obscure, yet it first attained prominence as a commercial variety through the foresight of a Philadelphia grower. Liberty, now so thoroughly established as a forcing variety, came into prominence through the efforts of a Philadelphian grower. Even that much discussed variety that to-day, for amateur cultivation, is perhaps the leading rose of its color, achieved notoriety through one of your local growers. Though gallantry was at stake as to whether it should be named for the bishop or the lady, the bishop won. I refer to Balduin—Helen Gould. I might mention a host of now famous varieties, such as Wm. Francis Bennett, Souvenir de Wootton, Golden Gate, Princess Bonnie, Pink Soupert, Marion Dingee, and many others, whose rise to fame and popularity came through the intelligent efforts of growers of Philadelphia and its environs. With these facts in mind, I approach the subject with considerable apprehension.

I am conscious of the fact that in the brief limitations of this paper it will be impossible to cover the subject completely and accurately. I shall, therefore, give you my observations as they have occurred to me in the daily contact with over a thousand different varieties of roses, coming, as they have, from all parts of the world. I shall speak only of roses now in commerce, and while some varieties may be mentioned that are not entirely new, so far as recent origin is concerned, yet it is to be borne in mind that there are a great many roses "born to blush unseen and waste their sweetness on the desert air;" many for years remained unnoticed with their latent beauty undeveloped, until through sheer force of worth they rose to fame and glory. We have notable instances of this fact in Golden Gate, and, more lately, that Irish beauty, Killarney. I shall also give equal prominence to varieties that are undoubtedly valuable, not only for forcing purposes, but those varieties appealing to amateur growers, whose ranks are constantly increasing. Of this class, for whom I feel better fitted to speak than from a strictly professional standpoint, I can say that it is a gratifying indication of the rapidly increasing love for the queen of flowers, that the average amateur enthusiast—and there are thousands of them in all sections of the land—is keenly alert to the improvements of the rose, and not infrequently has a knowledge of varieties as accurate as that of the professional grower. This growing interest of the masses bodes well for the future of the rose, and should prove a stimulus to American hybridisers, who may feel assured if their creations have merit that the rose-loving public will be quick to give them deserving recognition.

It seems fitting that I recommend at the outset that sensational new rose, Mme. Norbert Levavasseur, or Baby Rambler. This vivacious French debutante is the rose that blooms every day in the year.

Growing in its full vigor 20 in. high, with finely polished dark green foliage, with which it is abundantly supplied, it forms a compact bush which with ordinary care is a mass of shining crimson beauty. For every purpose from the florists' standpoint it possesses the highest value, and for the amateur it is equally valuable. It is, indeed, a perpetual blooming, dwarf Crimson Rambler.

In the Rambler class may be also mentioned a variety that does not seem to gain the recognition it deserves as a rose of splendid worth—Dorothy Perkins. It is a true Rambler, particularly valuable for Christmas work, and equally as valuable in the open ground; thoroughly hardy, bearing in large clusters beautiful, clear, shell-pink flowers of excellent substance. Philadelphia Rambler, a recent introduction, bears out all that is claimed for it, and in some respects is an improvement over the old reliable Crimson Rambler.

One of the most unique and valuable of the newer roses is Soleil d'Or, the first of a new race, a cross between Persian Yellow and Antoine Ducher. It forms a strong, sturdy bush, very robust in habit, with foliage that emits the true sweetbriar fragrance. The flowers are sunset yellow or reddish gold, and are highly fragrant; hardy everywhere; splendid for single specimens or for hedges. In this same class of hardy roses of the rugosa and sweetbriar type may be mentioned Sir Thomas Lipton, a rugosa rose. The flowers are large, very double, pure white, and fragrant. It is freer blooming than any other rugosa, and will prove a splendid variety for hedging purposes. From Germany comes another great new hardy rose—Frau Karl Druschki. The flowers are almost as large as those of American Beauty, deliciously fragrant, full, deep, and double. This variety may be called a free blooming hybrid perpetual, being a cross between Merveille de Lyon and Mme. Caroline Testout. The color is snow white. Apart from Margaret Dickson, we do not have a really great white rose in this class, and this variety may be considered one of the best, if not the best hardy hybrid perpetual rose of its color.

Among the newer hybrid teas of prominence and merit we have Bessy Brown, a really wonderful rose, with large, double, deep flowers, borne on strong, erect stems, after the style of Souvenir du President Carnot, which it resembles in growth and somewhat in flower, but is distinct enough to deserve a place at the head of the list. We hear but little of the rose that bears the honored name of Admiral Schley, which as a pot plant possesses rare value. The color is rich, glowing, velvety crimson. The flowers have unusual substance, a valuable point, are delightfully fragrant, and borne in great abundance. A clean, healthy dwarf grower, with splendid foliage. Since Killarney has become recognised as a rose of more than ordinary merit, such roses as Mme. Jules Grolez, its counterpart in color and almost equal in flower, remains unnoticed; a splendid grower, and with proper management, it should prove a strong competitor of Killarney. The list is incomplete without Lady Joy, a cross between American Beauty and Bell Siebrecht, a royal parentage; flowers large, cup-shaped, almost double, with enormous shell-like petals of good substance, highly fragrant; the color is new—lively crimson. Mrs. Robert Garrett is of the same type, but not as free blooming; immense, bright, clear pink flowers. We cannot omit Winnie Davis, one of the fairest of the newer hybrid tea roses; very free blooming, of good habit of growth, with immense, long, heavy buds, splendidly formed, developing into unusually large flowers; color bright apricot-pink, shading flesh tint at the base of petals.

Right here I wish to compliment our American rose growers upon the splendid results achieved in producing new roses of thers across the sea have done for the rose, merit. Fully conscious of what our bro- for which we are indebted to them, I would say naught against the magnificent work they have done, and are doing. Unlike our American growers, however, who hesitate to offer a rose unless it be of pronounced merit, from my own personal experience, each year hundreds of varieties are produced in Europe, many of which have little or no merit to commend them. I know of nothing that is so fraught with pleasure, as well as disappointment, as the trying out of new roses, and it has been the practice of our company up until recent years to try out the new roses of Europe as they have been introduced, and I can say that the large majority of these new varieties of foreign origin have been disappointing. Therefore our American growers are to be not only congratulated, but also commended, upon the work they are doing, and the precaution shown in introducing any and every seedling they originate.

I need not call attention to Mr. Hill's splendid new rose, Richmond. It has spoken for itself, and, as a candidate for popular favor in the class of red forcing roses, it seems to be a decided improvement over any we have at this time. Rosalind Orr English is another promising hybrid tea. John Cook, to whom we doff our hats as one of the veteran introducers of meritorious new roses, contributes Cardinal, a beautiful crimson hybrid tea, and Enchanter, an extremely free blooming variety, with large, clear, bright pink flowers. Mr. Cook selects this variety as the best of over 500 seedlings. Let me recommend Souvenir de Pierre Notting as one of the best roses for all around purposes introduced in many years. It will take front rank, if not surpass from every standpoint, white and pink Maman Cochet, the best roses for summer flowering in the open ground. This new variety is a splendid grower, throwing up beautiful flowers on long, stiff, erect stems. The bloom is large and double, opens easily, and possesses unusual substance. Difficult to describe, apricot yellow, tinged with golden mixed with orange yellow, while the edge of the petals are shaded carmine. Every florist who has a foot of ground for summer roses should have this one. Mme. Derepas-Matrat has established itself as a companion to the Cochet roses, which it resembles in every particular, except that the color is deep yellow.

The following varieties are also among the most promising of the newer sorts: Canadian Queen is an improvement over Mrs. J. Pierpont Morgan, Mme. Cusin, and Mrs. Oliver Ames, the latter of which it resembles in color; General MacArthur, a vivid crimson hybrid tea; Red Chatenay, deeper in color than the parent; Uncle John, more pronounced in color than Golden Gate; Beauty of Rosemawr, rich carmine red, valuable for outdoor purposes; La Detroit, distinct and valuable, shell pink, good for forcing; Saxonia, worthy trying as an improvement over Golden Gate; Mrs. B. R. Cant, unusually valuable for amateur cultivation, better than Papa Gontier; Aurora, an improvement over Hermosa; Franz Deegen, an immense deep, double yellow rose, alike in habit and growth with Kaiserin Augusta Victoria, and far superior to Perle von Godesburg, sent out as Yellow Kaiserin; Florence Pemberton, a strong growing hybrid tea, large shell-pink flowers, good for open ground work; Maddalena Scalarandis will rank with the Cochet roses outdoors; color rich, dark pink, on yellow ground. Ideal ranks with Bridesmaid and La France, pink in color. As an example of an exceedingly rare rose, I mention the variety York and Lancaster, which dates back to the War of the Roses between the royal houses of York and Lancaster, said to have originated when when these warring factions became united, its colors representing the white of the Yorkists and the red of the Lancastrians, the flower being a combination of red and white, blotched and striped. Magnafrano is a free blooming hybrid tea, with large, double pink flowers. Wellesley is a remarkably free flowering forcing variety. The color is bright pink; a good keeper. For greenhouse men doing a local trade there is always a demand for a hardy ever-blooming climbing rose. To meet this demand there is no better variety than Climbing Clothilde Soupert.

The list of the newer and promising varieties could be extended to considerable length, but I feel that I have already encroached too far upon the patience of you gentlemen, and in thanking you for your kind attention, I wis hto express the hope that I may have said something of value to growers, as well as helped deserving roses to greater popularity.

THE ROSE.

Is it any wonder that poets and artists are always striving with all the power that is in them to catch the beauty of the great floral queen? No, it is not. They would fail in their missions did they not hear or not see, or not bow before the beauty of the flower which stands highest in the estimation of the world's gardeners. Such a flower as the rose could not possibly be hidden long. The poetic sense must soon be drawn towards her, and the artistic eye find all that it seeks in the colouring and form of her lovely leaves and flowers. Roses were made to be admired, and men and women would not be what they have proved themselves to be, had they passed the beauty of the rose by. Flower lovers we are all, and, more or less, in quest of the beautiful, hunting it day by day, as the bee does the opening bud, which it knows to contain two factors—honey and pollen—that give it life. When the beautiful comes to us, as it does so often in the form of a rose in the prime of life, we do well to stay, if only for a moment, to catch and feel the glory, the strength, the sweetness, and the inspiration which are folded so prettily in the petals which form the flower. Straight from the heart of mother Earth these wondrous petals have come to give us cheer. Take all they have to offer and be glad.

"Gather ye Rose-buds while ye may,
Old time is still a-flying;
And this same flower that smiles to-day
To-morrow will be dying."

Roses, like the time and tide, wait for no man. You must be ready and waiting, or they pass you by. Like a flash of sunlight, or a passing shower, they come and go, but between their coming and their going they leave much that is worth having behind.

Scotland's great poet, writing as usual with much insight, feelingly says:

"May'st thou, long, sweet, crimson gem,
Richly deck thy native stem;
Till some ev'ning sober, calm,
Drooping dews, and breathing balm,
While all around the woodland rings,
And every bird thy requiem sings:
Thou, amid the dirgeful sound,
Shed thy dying honours round,
And resign to parent earth
The loveliest form she e'er gave birth."

Why write more? The rose is here with us to-day, to speak for herself. Find her and hear what she has to say. She is over there in the garden in all her sweet loveliness waiting but to be admired.

—From the Amateur Gardener.

FITTONIAS.

Although Fittonias are stove plants and revel in the heat found therein, they may be grown in the greenhouse during the greater part of the summer and autumn, and bearing in mind that they are extremely beaatiful in appearance, having prettily-veined and netted foliage, are dwarf, and most useful for growing in pans and baskets, or in pots for the fronts of stages, one sometimes asks the question as to whether they are known as much as they ought to be. Light loam and leaf-mould are the compost they need, the warmest part of the house, and a moist, partly-shaded atmosphere. They strike very freely, and those who grow Coleuses or Gloxinias can grow these showy, fine-foliaged plants.—Leahurst.

DAHLIA KAISERIN AUGUSTA VICTORIA.

I have tried this dahlia for two years, and am convinced that it is the best white dahlia is existence. I grow mostly white dahlias for cut flowers, and, after having tried all the so-called best white sorts, have not found any to equal Kaiserin Augusta Victoria. It is of the decorative type; flowers of the purest white; size, 4 to 5 in. diameter; double. The plant grows 3 to 3½ ft. high, is of sturdy and compact habit, and does not require staking. The profusion of blooms is remarkable, exceeding any other sort in the field. The flowers can be cut with stems 12 to 18 in. long. The plants frown from cuttings will make the best plants and produce the largest, finest, and longest stemmed flowers.

Kaiserin Augusta Victoria was awarded special premium by the American Institute, New York, at its dahlia exhibition in October, 1904. The awards committee of the New York Florists' Club, who visited my place and saw the plants growing, reported to the club, October 10, 1904, as follows: "It is unquestionably a valuable addition to the race, and where white summer flowers are wanted will prove of great value."

A. L. Miller.

Brooklyn, N.Y.

LILIES IN THE GARDEN.

These noble garden flowers have only within recent years been planted largely in the best possible way, and that is among shrubs. At one time they were considered suitable for pots only; but under these conditions the finest growth and bloom were never obtained. Planted in the open, however, among Rhododendrons they are thoroughly at home. We were once much struck by the appearance of L. elegans, or L. Thunbergianum, as it is more often called, planted among dwarf, dark-leaved shrubs, kalmias, &c. The contrast of leafage and flower was rich and telling. We may make use of almost every lily in this way, even L. longiflorum, which is often supposed to succeed only in a pot in the greenhouse.

L. elegans is a splendid early lily, while there are many varieties differing widely in habit and color of the flowers. The tallest should be planted among the shrubs, and in large spreading masses there are always openings through which can ascend the stately spikes of brilliantly-colored flowers, reserving the dwarf kinds, those that grow only from 1 ft. to 18 in. in height, for the outside. Such varieties as the apricot-colored alutaceum atro-sanguineum (deep crimson, height 1½ ft.), Van Houttei, fulgens, Prince of Orange (orange), and cruentum (crimson), are all of dwarf growth, and adapted for edging peaty beds filled with shrubs. In growing the Lily in this form there is very little trouble. The soil that suits such shrubs as the Rhododendron also agrees with the lily, and the growth protects the tender rising stems in early spring, when, except for this protection, they would suffer from frosts. A top-dressing of manure each year will keep both shrubs and lilies in vigor, but it must not be dug in.

Lilium testaceum (Nankeen Lily) is a distinct and fine lily that does well in the soil that will suit rhododendrons. The best lily, however, for planting in this fashion is L. auratum. The large masses of rhododendrons on either side of the main walk are generally a picture of color in autumn at Kew Gardens, the bold spikes of this Japanese lily appearing in profusion, the flowers large, numerous, and finely colored, finer far than anything we can obtain in pots. It is under these conditions that screened from heavy rains, cold winds, and late frosts. Those who have no large clumps or shrubs to plant it in should choose a sheltered situation, not exposed to the full beauty of the variously colored flowers is obtained. The bulbs are in the soil that suits them, and the growth is the full glare of the midday sun, and where the soil is rich and well drained. It will succeed in ordinary garden material, if this is well manured, but it likes best an admixture of peat and loam. The finest results with Lilium auratum have been obtained by planting it among rhododendrons.

A PRETTY AQUATIC.

The purple Loosestrife (Lythrum Salicaria). In a tub I have had it growing up fifty of its pretty racemes of flowers, about 2 ft high, and much admired by many who were not familiar with it in its wild state, and autumnal foliage, of a reddish-brown shade, is also beautiful. Small yellow seeds are produced in abundance. Blue tits seem fond of these, and are often seen climbing up the sprays searching for them. The Loosestrife is perennial and requires no care in growing beyond seeing that the tub is well supplied with water, and the roots spread till they soon quite fill the receptacle.

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THE PEACH-LEAVED BELL-FLOWER.

Amongst the many beautiful Campanulas none are more popular than C. persicifolia, the peach-leaved bellflower, and for beds and borders it is largely grown, having a prominent place in not a few country gardens where hardy plants are specialised. This variety is often to be seen planted in rows, or grouped together as a "second line" subjects, backed up in many instances by tall-growing delphiniums, &c., and in December and January such gardens are always effective. The blue variety is possibly the least grown, inasmuch as the white sort is in greater demand where cut flowers are wanted, but both have their place in borders where hardy flowers are cared for. All campanulas love a sunny situation, good soil well manured in the autumn, and need division every two years. Some that I neglected to divide for several years became weak in the centre of the clumps, and died off in the winter, whilst plants in small groups from a biennial division bloomed much better. Many who grow Campanulas seem to think that they will do with any kind of treatment, hence one sometimes finds them planted in out-of-the-way corners, under trees, &c., but to get the best results from them they must have a sunny aspect, and, as stated, a rich soil. Old stools should be pulled to pieces in March, replanted in fresh positions, as, by so doing, one will get much stronger bloom spikes. We often forget how useful campanulas are for pots, and for cool houses they should be borne in mind.—Woodbastwick.

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THE CAUSES OF DOUBLING IN FLOWERS.

The botanists find the doubling of flowers a somewhat hard nut to crack. There are several forms of doubling, one of the most common being found in the multiplication of petals. But when the inducing causes of doubling are considered, there is ample opportunity for speculation. In a general manner, the causes assigned by physiologists, or the plans proposed by cultivators, are reducible to three heads—namely, plethora, starvation, and sterility. As Dr. Masters stated many years ago, these three seem in consistent one with the other, but are not so much so as they appear at first sight to be. The advocates of the plethora theory have much in their favor; for instance, the greater frequency of double flowers among cultivated plants than among wild ones. Dr. Seemann brought out the facts of the great preponderance of double flowers in plants derived from the northern hemisphere, when contrasted with those from the southern. Cases have been known of debility or starvation having the effect of changing flowers to the double form ; but then it has had a contrary effect also, as a case has been mentioned of a double-flowered thorn producing single blossoms from this cause. Mr. Darwin makes mention of a state of things which brings about sterility or imperfect formation of the flower, leading to a consequent increase of the petaline element, either in the form of an increased number of bracts, petals, &c., or in the substitution of petals for stamens and pistils.

It is said that the way in which double stocks are produced in Erfurt is by giving the plants a minimum supply of water. This much appears to be certain, that when once the disposition to form double flowers is established from any cause, that tendency becomes hereditary; there are races of stocks in which out of hundreds of plants scarcely one double flowered form is met with; this is particularly so in the case with the Giant Brompton, and especially so in the case of the White Giant; on the other hand, where the tendency is set up, single flowers become the exception.—R. DEAN, in "Horticultural Trade Journal," Eng.

CAN SPORTING IN PLANTS BE INDUCED?

The sporting of plants, as we term the vegetative variations which occur during the life of the individual, is only a special form of variation. Variation we know is the natural tendency of plants and animals. The direction and extent of such variation is frequently predetermined by external circumstances—environment—or by inherent tendencies of the individual or species.

In fact, fixity of type, either in nature or under cultivation, is a very difficult thing to attain, as all seedsmen and plantsmen well know. The fixity which appears to exist in nature and which is responsible for the existence of so-called species, is the result of certain limiting forces working in conjunction, through countless generations. Break up this dead-lock, and the species almost invariably throws off varieties—a convenient term for indicating a departure from the parent type.

From what has been said it will be evident that I consider a sport simply a marked variety or variation, which may appear as a distinct individual, or as a part of an individual during its period of existence, in which case, for purposes of distinction, we are pleased to call the latter a bud sport or variety.

Sporting, then, may be encouraged by extreme conditions. Either extreme feeding or extreme poverty may induce plants to sport. Severe changes in climate or soil conditions may result in decided changes in stature, habits of growth and fruitfulness, which are as marked attributes of a sport as are changes in the colour of foliage or fruit.

Burpee dwarf lima bean is a good example of a sport where the habit of the plant was markedly changed. The white and fancy sports of the Lawson carnation are good illustrations of changes in colour.

Just here I wish to note that in a bed of Mrs. Lawson and upon a plant with otherwise normal flowers, one shoot produced a blossom, one-half of which was pure white, while the other half was of the normal pink of the Lawson. These sports in the Lawson are exceedingly interesting, for they clearly indicate that the Lawson is composed of two parts, pink and white, in which the pink is the predominant. Under favourable conditions, however, the white asserts itself, and we have the sports above spoken of. This frequent breaking out of a recessive character is all the more interesting in the case of the Lawson carnation on account of the fact that neither of its immediate parents were white, the Lawson being the result of a cross of Daybreak, pink, with Van Leeuwin, cerise. The facilities now at hand do not allow me to analyze the composition of either Daybreak or Van Leeuwin, but I suspect from the behaviour of Lawson sports that one of these parents, and perhaps both of them, have a strong white strain of blood in them.

From what has been said it is evident that cross-pollination is believed to be one of the most important means through which the sporting or variation of plants can be induced. The wonderful results obtained by Burbank in his work with fruits has been based almost entirely upon the practice of cross-pollination. In connection with this work, there seem to be two pretty well established theories. They may be stated somewhat as follows:—When working with species the more violent the cross that can be secured the more variable will be the hybrids in the second generation, and the more likelihood there is of securing distinct forms of monstrosities. Second, that when working with plants which are themselves of cross-bred or hybrid origin the peculiar attributes of the particular plants used for breeding purposes cannot be counted upon to appear in the mongrel offsprings, except in so far as these characters form important dominant or recessive characters in the breeding of the parent plants.

The marvellous results achieved by some of our moderate plant breeders seem to lie in their wonderful skill as manipulators of plants. Crosses have been successfully made by these men, and fertile seeds obtained from plants which have been considered incompatible and so entirely distinct, that it was considered heresy to seriously consider the question of making such a cross. I am free to confess that with ninety-nine persons out of every hundred engaging in such work I believe the results would be "nil." The success of the one proves his superior skill and ability to discern the conditions essential for success.

The factors, then, which may be considered as contributing to the sporting of plants are: Extreme conditions in the environment, such as marked changes in latitude, altitude, soil conditions, as from alluvial to desert, increased food supply, the results of an excessive use of plant foods or of cultivation, and violent or continuous cross-breeding.—L. C. Corbett before the American Institute, New York.

SCARLET SALVIAS.

If you have any old plants place in a good, light position in the greenhouse—that is to say, a structure whose minimum temperature is about 45 degs. Give sufficient water to keep the soil slightly moist, but no more; indeed, the object is to maintain the plants in a quiet state till the spring, when young shoots will be pushed out freely. These shoots will strike without difficulty if taken off at a length of about 3 inches, dibbled into pots of sandy soil, and placed in a close propagating-case in the warmest part of the greenhouse. Of course, these cuttings must be shaded from the sun till rooted. When potted off pinch out the growing points in order to encourage a bushy habit, and, directly the roots take hold of the new soil, give plenty of air. Pot on as may be necessary, and grow in the open air during the summer, bringing them into the greenhouse in the autumn, where they will come into flower. One thing to be particularly careful about during the early stages of this Salvia under glass is to see that the foliage does not get affected by red-spider, as it soon causes a good deal of damage. Too dry an atmosphere is especially favourable to the development of this pest.

VIOLET CULTURE.

I have seen various notes as to growing and watering violets in gardening and other journals. My method of culture for both single and double varieties is as follows: I take the young rooted runners that have not flowered from the old plants that have done blooming, dibble them into a border facing east or west, 6 in. apart each way, water them in well, and continue the watering throughout the summer. Never let them want for water at any time in their growing period. Keep them hoed, not too deeply, and pinch all the longest runners from them. Syringe them in the afternoon of hot, dry days with clear rain-water, and occasionally mix a little soot-water with the rain water, also once every three weeks use a little farmyard manure water with the clear water. If they are planted in some good garden soil, which has been given a dressing of cow manure and soot, you will be rewarded with some good clumps by the end of March. At this time make your beds up for them in frames, using good loam, leaf soil, burnt earth, soot, and a little bonemeal; mix well up together. Place in frame to a height that will allow about 2 in. space clear from the lights. Plant the violets in this mixture 9 in. apart each way, water them in thoroughly, keep the lights off them night and day, excepting in wet weather; then run the lights over them, lifting them sidedays, which will admit air top and bottom of frame. Mat them over to keep frost out, pick all dead, damped leaves from them, stir the surface with a label to keep moss down; then I think the violets will reward you with their sweet blossoms through the winter.

AUTUMN PLANTS.

Many of them are indispensable for autumnal effect in the border.

Agapanthus umbellatus.—This handsome plant, a native of the Cape of Good Hope, is one of the most decorative of autumn-flowering subjects. In favored spots in the south-west it succeeds admirably planted permanently in the open, producing its tall blue flower-umbels in quantity year after year. In colder districts it creates a telling effect if grown in large pots or tubs and placed in the open during the summer months. Tubs are preferable to pots, as when the plants become pot-bound—in which condition they flower most abundantly—the force exerted by the expanding roots generally breaks the pots if these are not bound round with copper wire. At the advent of frost, the plants should be removed under shelter, and very sparingly watered until they commence to make growth in the spring. There is a white form of Agapanthus umbellatus, and also a distinct white-flowered species, although this is not recognised in horticultural dictionaries. The latter is deciduous, whereas the type is not, and bears taller flower umbels. Both the white-flowered African Lilies are perfectly hardy in the south-west.

Anemone japonica.—The well-known Japanese anemone is met with in three colors—namely, white, flesh-pink, and magenta, the last being a tint that should never be admitted into the garden. Honorine Jobert is a beautiful white variety, and, when at its best, reaches a height of 5 ft. and flowers profusely. Newer forms are Lady Ardilaun, Lord Ardilaun, and Whirlwind, the two last being semi-double.

Perennial Asters or Michaelmas Daisies. These charming plants are the mainstay of the autumn garden, the different species blooming for a period of considerably over three months. The earliest to flower is A. Amellus, of which species A. Amellus bessarabicus is an excellent large-flowered form bearing violet-blue blossoms. It often commences to flower in January, and remains in bloom for many weeks. It is comparatively dwarf, and has not the spreading habit that renders so many of this genus unsuited for a small garden. The last to flower is the handsome A. grandiflorus, which is rarely in bloom before the end of April or beginning of May, a date which makes its culture inexpedient in cold districts. It bears very large flowers of a deep purple hue with golden centres, and is extremely decorative when in full bloom. It may be lifted carefully and potted when the buds are formed, and will then expand its blossoms under glass. Other good varieties are A. acris, lilac-purple, forming a sheaf of flower; Esme, a dense bush with white flowers of the size of a florin; A. lævigatus, rosy; A. patens, sky-blue; A. ericoides, bearing a profusion of tiny white daisy-like flowers; and A. (Chrysocoma) linosyris, a British plant commonly known as Goldilocks, but valuable for its dense corymbs of bright yellow flowers. All the foregoing are dwarf varieties, rarely exceeding 2 ft. in height. A. cordifolius is a most graceful plant. Photograph, with small lavender flowers, is, perhaps, the best variety. A. Shorti bearing sprays of bright lilac flowers is also particularly good. These two generally reach a height of between 3 ft. and 4 ft. Perry's Pink producing large bright pink flowers is very distinct and ornamental and grows to the same height. Of the Novi-Belgii section Archer Hind, soft blue, Harpur-Crewe, and Purity, white, and Robert Parker, lavender, are well worth growing. They are mostly tall growers, the last-named sometimes reaching a height of 7 ft. A. lævis Arcturus is a handsome plant with black stems and lilac flowers, with a suspicion of rose, and A. puniceus pulcherrimus is a noble species and a very vigorous grower, attaining a height of over 6 ft. Every spray of the plant is thickly covered with flesh-tinted flowers, which become white with age. Of the Novæ-Angliæ section, Melpoment, purple, and ruber, rose-colored, are the best. Boltonia asteroides and B. latisquama are two aster-like plants, natives of North America. The former bears flesh-colored flowers, and the latter lavender.

Cannas.—Since the raising of the new large-flowered Cannas these plants have become most admirable subjects for the autumn garden. In the south-west they may be allowed to remain undisturbed in the beds through the winter, but in more northern districts they must be lifted and housed like Dahlias, and started in heat in the spring. Of the Crozy Cannas, which are comparatively dwarf, the following are good varieties: Beaute Poitevine, scarlet; President McKinley, vivid vermilion; Duke of Marlborough, deep crimson; Aug. Chanpink; Secretary Chabanne, orange; Lighthouse, yellow; Queen Charlotte, scarlet with broad yellow margin; Paul Meylan, buff with narrow yellow border; Fol. Bertine Brunner, very large yellow with small red spots; Comte de Bouchard, yellow heavily mottled with crimson; and Mme. Pichon, yellow with centre of petals splashed red. Of the Italian Cannas, which grow to a great height and bear flowers from 4 in. to 6 in. in diameter, good varieties are Allemannia, America, Italia, and Pluto. The far older Canna, Ehemanni iridiflora, with its great, Musa-like leaves not be omitted.

Chrysanthemum maximum, with its large, daisy-like flowers, is a well-known autumn bloomer. Of late, dwarf varieties, more free flowering in habit and bearing larger blooms, have been raised, which are tin, orange-pink; Annie J. Chretien, flesh-and slightly drooping scape of rose-cerise flowers, is also very beautiful, and should superior to the type.

Coreopsis grandiflora, though commencing to flower early in the summer, often continues its display through the entire month of August.

Crinums.—These noble Cape bulbs are perfectly hardy in the south-west, and if planted at sufficient depth and mulched during the winter would doubtless prove so further north. At any rate, they are worth a trial. C. capense, or longifolium, is the best known, but cannot compare with C. Powelli and its variety C .Powelli album, C. Moorei, and C. Moorei album, the latter known on the Continent as C. Schmidti or C. Yemense. When in flower these crinums, with their tall bloom-scapes bearing several giant blossoms, make a splendid display in a wall-backed border.

Dahlias are too well known to be dealt with at length, but it may be said that no autumn garden is complete wihout them. For decorative effect the cactus varieties take the precedence, but care should be betowed on the selection, and only those which throw the flowers well above the foliage should be ordered. A selection made a a flower show, where the individual blooms are displayed on stands, is certain to be unsatisfactory, as many of the varieties that produce the most perfect blossoms bear them hidden by the foliage, and are, therefore, utterly useless for the embellishment of the border. Dahlia tubers must be lifted after the first frost and kept in a dry cellar or other frost-proof structure until the spring, when they should be started in heat.

Galega.—The type which bears rosy-lilac pea-shaped flowers and its white form are excellent border plants, forming dense bushes 4 ft. or so in height, smothered in bloom-racemes.

Gladiolus.—The common scarlet G. Brenchleyensis is amongst the most effective of border plants, while the newer G. Childsi, G. nanceianus, and Lemoine's hybrids bear wonderfully large and handsome flowers. The foregoing and the G. gandavensis section may be left undisturbed in the ground through the winter in favored localities, but, generally speaking, it is safer to lift them when the foliage withers

Helianthus.—The perennial sunflowers make a brave show in the autumn with their bright yellow blossoms. H. multiflorus and its double variety Soleil d'Or are the most generally cultivated forms, but there are other species and varieties that are of greater merit. Amongst these may be named H. rigidus Miss Mellish, H. lætiflorus, and the new H. G. Moon. Other good species are H. giganteus and H. orgyalis, both of which attain a height of 10 ft.

Lobelia cardinalis.—This and L. fulgens, with their glowing crimson flower-spikes, are without peers for brilliant effect. In damp, holding soil they take no harm during the winter in the open bed, even if exposed to 20 deg. of frost. In light soil they often fail, the crowns rotting in the winter. Where this is found to be the case, the clumps should be lifted when the flower-stems wither, packed closely together in boxes, with a little dry earth or cocoanut fibre shaken in between them, and kept in frames until the spring, when they may be divided, started into growth, and replanted. These lobelias are easily raised from seed, and, where they are found to be liable to winter failure, seedlings should be raised annually from home-saved seed.

Kniphofia or Tritoma.—The popular Red-hot-Poker or Torch Lily, with its glowing spires of bloom, is an especially effective autumn subject. Of late years numerous new species have been introduced to supplement the old K. Uvaria, many of which are desirable. Kniphofias require a warm situation and porous soil, which does not retain moisture in the winter.

Physalis (Winter Cherry).—P. Alkekengi is a very old garden plant, having been introduced over 300 years ago. Its orange-scarlet bladders which enclose the fruit are very decorative in the garden, and still more so for winter indoor decoration. It is entirely surpassed, however, by P. Franchetti, whose great balloons are sometimes 8 in. in circumference. Both are perfectly hardy and increase rapidly.

Pyrethrum uliginosum.—Many who have but slight knowledge of flowers class this with the Michaelmas daisies, which it somewhat resembles in manner of growth. Its large, white, starry flowers, with their narrow rays, are very graceful, and a fine plant in full bloom presents a charming picture.

Senecio pulcher.—This plant grows to a height of 3 ft., and bears large flowers of a deep magenta tint. Those who dislike that color should eliminate it from their list of desirable autumn flowers. The three following plants may be termed winter flowerers:

Schizostylis coccinea is a small bulbous plant, growing 18 in. in height, and bearing scapes of bright crimson flowers. It blooms from April to June if the weather be mild, and is most useful for indoor decoration.

Iris stylosa.—This lovely Iris and its white variety bear their blossoms from the end of October until April. Large plants produce a continuous supply of flowers, which should be picked in the bud stage and expanded indoors, where they are always welcome, being deliciously fragrant as well as very beautiful. The plant does best on a dry bank of light soil, and in cold districts should be planted against a wall in porous compost with rapid drainage, and should be sheltered from cutting winds.

Christmas Roses.—These chaste flowers, coming, as they do, in mid-winter, are of inestimable value. The first to flower is the giant Helleborus altifolius or maximus, which commences to bloom in May. Other grand varieties are H. juvernis (St. Brigid's Christmas Rose), H. major, Bath variety, the Riverston variety, the Brockhurst variety, Mme. Fourcade, and the Manchester and Scotch varieties of H. angustifolius. Christmas Roses require deep, retentive, well-manured soil and a partially shaded position, where they are not burnt up by the summer sun. In dry weather they should receive copious supplies of water.

S. W. F.

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The Orchard.

OPERATIONS FOR MAY.

(By W. J. Allen.)

Where it is intended to plant deciduous trees, either as refills or in laying out a new orchard, no time should be lost in getting the land into fit condition to receive them. If the trees are not already ordered, this should be done without further delay, and they should be planted immediately upon delivery.

In the average soil, the most suitable distance apart for planting apples, citrus fruits, peaches, nectarines, plums, pears, and apricots is 24 ft.; in very rich soil, however, this distance may with advantage be extended to 30 feet. A few varieties of plums and pears would, perhaps, do well if planted 20 feet apart; but, generally speaking, I favour giving trees a good space of ground to feed in, as, owing to the recurrence of droughts, the trees, if they are of any age and planted close together, are bound to suffer more than those which have been allowed a liberal space of land from which to draw nourishment.

The following table shows the number of trees or vines to the acre at the distances apart given, viz.:—

Distance Apart.	No.	Distance Apart.	No.
4 x 4	2,722	15 x 15	193
5 x 5	1,742	16 x 16	170
6 x 6	1,210	17 x 17	150
7 x 7	888	18 x 18	134
8 x 8	680	19 x 19	120
9 x 9	537	20 x 20	108
10 x 10	435	25 x 25	69
11 x 11	360	30 x 30	48
12 x 12	302	35 x 35	35
13 x 13	257	40 x 40	27
14 x 14	222		

Many of our nurserymen fumigate the trees before sending them from the nursery, as an extra precaution against any unforeseen pest which might have settled on them by chance. I am pleased to say that we have nurserymen carrying stocks free from diseases, and it is from such nurserymen that growers should endeavour to procure their trees, as the average orchardist has quite enough to put up with, without the further imposition upon him of an army of pests introduced with his nursery stock.

In every case, the yearling trees is the best to buy, yet many there are who away with the mistaken idea that the largest must be the best. A well-grown yearling tree is always preferable.

Pruning may be started towards the end of the month; but if the orchardist can put it off until next month it would be as well, as there is no advantage to be derived from pruning too early.

Citrus fruits, where at all subject to frosts, should be properly protected before they have suffered damage from these causes. This may be done by binding loosely about the young tree a sheaf of maize or sorghum stalks, tea-tree bush, or anything that will afford the tender foliage fair shelter.

Many of our fruitgrowers are now using lime in varying quantities from a half to one ton per acre, and have derived very gratifying results from its use. Lime has the effect of changing the physical properties of a clay soil, making it more friable and easily cultivated, and putting it into a condition so that water may pass more freely through it. This will make it less susceptible to extremes of dry or wet weather, and make it a good home for the order the older or larger trees, being led roots of the plants. The action of lime on sandy soils will naturally be the reverse stick together, and in such condition that they will hold more water and not dry out so quickly.

See that no codlin moth grubs are left under the bandages on the trees; but, instead of removing the latter, allow them to remain for a month or two, as it is possible that during the cold and rainy season a few odd ones may be driven from their shelter, and will find a refuge in these bandages. The latter, however, need only be examined occasionally. I would strongly urge those who have been troubled with the San José to spray the trees with the lime, sulphur, and salt solution after pruning, and not to fail in burning all prunings. In this way the very worst trees can be practically cured at a very small cost.

Agricultural Gazette of N.S W.

PRESERVATION AND VALUE OF HEN MANURE.

Hen manure and poultry manure in general are very rich in fertilizing constituents, especially nitrogen, due to the fact that, in addition to the undigested residue of the food it contains, the urinary secretions, in which are large amounts of nitrogen as well as potash in readily available form, are voided with the solid excrement in this class of animals. The analyses which have been made show that hen manure is very variable in composition, depending upon the stage of growth of the fowl, the character of the feed, and the care taken of the manure. The nitrogen has been found to vary from about 0.7 to 2 per cent., the phosphoric acid from 0.5 to 2 per cent., and the potash from 0.25 to 0.9 per cent. This shows that such manure if properly cared for is much richer than that of other farm animals. It, however, quickly loses nitrogen by fermentation and deteriorates in value if not properly mixed with absorbents or preservatives. Various methods of preventing this loss has been proposed.

The New York Station advises: "When the manure is not used when fresh, it is better to mixe it with dry earth, muck, or plaster." The Massachusetts State Station says that the value of hen manure depends not less on the care which is bestowed on its keeping than on the kind of food the fowls consume. . . . A liberal use of plaster, kieserite, or of good loam is highly recommendable for the absorption of ammonia. . . . A sandy soil is of little use as an absorbent."

A common method is to sprinkle the dropping board from time to time with gypsum (land plaster), and in order to put the droppings into good form for distribution on the soil, to compost them with loam, leaf mould, and similar materials.

The Maine Experiment Station reports comparative tests of kainit, plaster (gypsum), and acid phosphate singly and combined with sawdust as preservatives for hen manure. Three nights' droppings of 180 mature, laying hens, amounting to about 45 lb., containing when fresh 2.8 per cent. nitrogen, 1.8 per cent. of phosphoric acid, and 0.9 per cent. of potash, were mixed with the various preservative materials and stored in barrels from May to November, 1903. An examination at the end of the time showed:

From the dung stored by itself or with sawdust more than half of this had escaped during the summer. The lot stored with 40 lb. of plaster lost about one-third, while the lot stored with 82 lb. of plaster and 15 lb. of sawdust suffered no loss. The lots with kainit and acid phosphate, both with and without sawdust, retained practically all of the nitrogen. Both because of the danger of loss, and its tendency to form into hard lumps, the plaster is less desirable than either of the chemicals tried. The addition of the sawdust materially improved the mechanical condition of the lots so treated. . . .

By itself, hen dung is a one-sided nitrogenous fertiliser. As usually managed, one-half or more of its nitrogen is lost, so that as ordinarily used it does not carry so great an excess of nitrogen. Because of its excess of nitrogen it will be much more economically used in connection with manures carrying phosphoric acid and potash. As both acid phosphate and kainit prevent the loss of nitrogen, it is possible to use them in connection with sawdust or some other dry material as an absorbent good dry loam will answer [well] so as to make a well-balanced fertiliser. For example, a mixture of 30 lb. of hen manure, 10 lb. of sawdust, 16 lb. of acid phosphate, and 8 lb. of kainit would carry about 1.25 per cent. nitrogen, 4.5 per cent. phosphoric acid, and 2 per cent. potash, which, used at the rate of two tons per acre, would furnish 50 lb. nitrogen, 185 lb. phosphoric acid, and 80 lb. potash.—Experiment Station Work.

Vegetable Garden.

OPERATIONS FOR MAY.

(By W. S. Campbell.

The vegetables have, lately, been as satisfactory as could be desired in districts which have been benefited by fair rains. The growth of many kinds has improved considerably in places where not very long ago dry weather was prevalent. No one should ever give up hope when growing vegetables or any other plants, and should have everything ready for planting and sowing when the weather breaks.

If the ground be turned up in ridges, either by spade or plough, it is not a very difficult matter to harrow and level down the surface sufficiently well for seed-sowing or planting. If ridged or dug roughly in the dry weather, the rain has an opportunity of sinking into the soil; whereas if left without any preparation, the rain would penetrate but slightly, and the best part of it would be lost. I have tried this over and over again, and am quite satisfied that not only with respect to vegetables, but to farm crops of all kinds, that the loss of precious water is enormous where preparations for making the most of all the rain that falls are not taken in hand in good time. This is a subject deserving of great attention, and which might be enlarged upon considerably if space permitted.

The gardener should always be ahead with his work, and thus save time and annoyance. As soon as vegetables are removed, sow or plant others, but to carry this out successfully it would be well to keep notes of the best kinds to follow one another. If, say, that you desire to plant cabbage after potatoes, note this some time ahead, and as the potatoes are removed manure well and plant cabbage, and so on with other vegetables. By keeping a plan of the garden, showing the various kinds of vegetables, the work of cropping successfully and economically can be managed not only without any trouble, but should give an additional interest to the garden.

Asparagus.—It may be as well to prepare for the planting of this vegetable, which, however, need not be planted until the early spring. When making the bed keep the surface low, even an inch or two below the level if it can be managed. Vegetable-beds, or flower-beds raised high above the surface of the genral level or the level of the road or walks, are not satisfactory during dry weather; and even should rains fall abundantly there need be no fear of the low beds if they be properly drained. There is some excuse for raising onion and potato beds somewhat, for both these vegetables need the very best drainage and the speedy get-away of surface water.

Beans, Broad.—This being one of the best times of the year for sowing this vegetable, plant as extensively as may be required—say every week. Sow in rows, the distance apart to be regulated according to the heights to which the different kinds are likely to attain—from 1 foot to about 4 feet. Sow the seed about from 3 to 4 inches deep and about 4 or 5 inches apart in the rows. The seeds are generally extremely hard, and may be improved by a soaking in water for an hour or two before sowing—that is if the soil is fairly moist, but if it be very dry, sow without soaking the beans. The reason for this is that, after soaking, the beans will start into growth, and if the soil is dry, the young tender growth will suffer from want of moisture and perish, unless rain happens to fall in the nick of time to save them.

Beans, French or Kidney.—Sow only in the warmest parts of the State where early frosts are not likely to occur.

Beet, Red and Silver.—Cultivate the growing plants well and thin out seedlings, but it is hardly worth chancing the sowing of any more seed for the present.

Borecole or Kale.—Sow a little seed, and if any plants have been raised, and are large enough to move, plant them out as you would cabbages.

Brussels Sprouts.—An effort should be made to grow this vegetable, for it is a good one, and cannot fail to give satisfaction to those who are successful in growing it. Use plently of manure when preparing ground for planting. Seed may be sown and young plants may be planted if they are ready.

Cabbage.—Sow seed of any suitable kind. Succession is a good variety, and so also is Phenomenal, a new variety tested by Mr. Ellis at the Howlong Vine Nursery for me; but smaller kinds are well worth growing, and are generally more tasty and tender than the large and strong growing kinds.

Cauliflower.—This needs more attention from the start than other members of the family. It should be grown without a check from the germinating of the seed, and care should be taken when transplanting, for a little care will or should repay the trouble. Sow a little seed, and plant out any strong young cauliflowers on hand.

Carrot.—Sow a little seed in order to keep up a succession. Thin out well as soon as the seedlings have attained a height of 2 or 3 inches, and keep the rows well weeded.

Celery.—A few plants may be planted now and then. Advanced plants which have pretty well attained full growth may be earthed up. As a large supply is not likely to be required, there is no need to set out very many plants at a time.

Endive.—Sow a little seed, and plant out from previous sowings. This is a good substitute for lettuce in cold districts.

Leek.—Seed may be sown extensively, and any young leeks already raised, and which are as large as an ordinary penholder, may be planted in very rich soil or soil made rich with abundance of good manure. If the weather and soil are very dry and water is not available in good quantity do not plant.

Lettuce.—Sow as extensively from time to time during the month as you may desire, and plant out any strong young lettuces available.

Onion.—This is an excellent time, in many parts of the State, to sow onion seed. When preparing the onion bed use manure freely, mix it well with the soil and make the surface level and as fine as you possibly can. Sow the seed in drills, and cover with very little fine soil. When the plants come up do not allow any weeds to grow amongst them.

Parsley.—Sow a little seed. There is a tradition that it is unlucky to transplant parsley, and at one time gardeners would absolutely refuse to translant it.

Parsnip.—Sow a little seed occasionally.

Peas.—Sow largely from time to time during the month.

Radish.—Sow a little seed occasionally.

Spinach.—Sow a little seed occasionally in drills about 15 inches apart. Thin out the plants when they are 2 or 3 inches in height.

Shallots.—Plant out bulbs as extensively as you need about 1 foot apart each way.

Herbs.—Sow a little seed of various kinds.

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The Flower Garden

OPERATIONS FOR JUNE.

(By W. S. Campbell.

The garden should still be quite gay with numbers of different kinds of flowers, although the time approaches midwinter; and the flowers which are now to be seen are more bright and beautiful, and are sweeter scented than the same kinds are during the warmer season of the year. Many varieties of roses, of bouvardias, and of many annuals and perennials are bearing abundantly. The camelias, too, are developing their flowers, which before long will be very conspicuous. Truly this is a wonderful country for flowers, which may be had for, one may say, the asking, by any one who will but take a little trouble. Many chrysanthemums are still flowering, but as the flowers fade away the flowering stems had better be removed by cutting down to the base. As the petals are somewhat persistent, the old flowers, when they are faded, are anything but ornamental.

In the coastal districts evergreens may still be planted, but in colder places this work should be postponed until early spring.

Plant out spring-flowering bulbs, if any good sound ones are still on hand, or can be procured. Plant out also a good number of seedling hardy annuals of as many varieties as possible, and these will make a fine show early in the spring, if they be looked after, and are not smothered by weeds, which is often the case, unfortunately.

Every cottage gardener seems to be fond of stocks, pinks, and wallflowers. All sorts of these (except the ten-weeks kinds of stocks, which should be kept back until early spring) may be planted. In the limited space set apart for these gardening directions it is impossible to do justice to the flowers, or to give more than a few of the barest hints, which may, however, be of some use to those interested.

The planting of all perennials, whether trees, shrubs, or herbaceous plants, should be brought to a close by the end of the month, although a month earlier would be much better. Very little root growth is made during the month of July and far in toAugust by plants that are put out after the middle of June, although those planted, say, in May, will continue forming roots the whole winter through. By this it will be seen that the difficulty a tree, shrub, or other perennial plant meets with in making a vigorous start is in the temperature of the soil. Planted in May, whilst the soil is still warm, the roots, with the aid of a little water, start off into a rapid growth which continues more or less until it is checked by the advent of summer, by which time the plant is well established. On the other hand, plants put out after the middle of June with shortened or mutilated root, from which all the newly formed rootlets have been rubbed and plunged into a soaked soil extremely low in temperature receive a check from which it takes weeks for them to recover, and even then heavy summer waterings must be resorted to, which adds very considerably to the expense of the garden. In planting trees the holes should be some 4 ft. across and 2 ft. deep. Before placing the plant in the hole half the soil should be returned and formed into a pyramid in its centre. In all cases of tree-planting the roots should be first straightened and laid out evenly, but pointed downwards, the plant being held upon the top of the pyramid, which should be made quite firm, with its top 3 in. lower than the surrounding surface. A layer of soil should then be thrown over the roots and trodden firmly, the hole nearly filled up, and water given. Trees which have been in pots too long often have roots matted and twisted round each other; such plants should be discarded, as the roots are split unavoidably and bruised in getting them straightened, and they decay in most cases. In shrub planting more care is necessary in preparing the soil. The whole of the ground should be broken up 2 ft. deep, as very few shrubs are able to penetrate ordinary solid soils. They are more particular as to quality of soil, and this is the reason some choice shrubs can hardly exist where others thrive well. This difficulty is overcome by thoroughly preparing the whole of the soil of the intended shrubbery. Manure liberally where the soil is of poor quality. As the larger growing shrubs are much hardier and less particular as to quality of soil and are planted in the back rows, the of these require a better or richer prepared soil. The most economical method of manuring the ground for a shrubbery is to divide it longitudinally into three strips. The front strip, where border bedding plants and the most dwarf and choice shrubs are planted, should receive three portions of manure; the second strip, two portions; and the back strip, one portion. In this way each class of plant will receive just what and as much as it requires. Neither does it matter what kind of manure be used—whether well-decayed stable dung, bonedust, or superphosphate—the portion should be the same. As regards the actual planting of shrubs, with the exception of very tall-growing kinds, there is no necessity for disturbing the roots as in the case of trees, although there is no harm in laying them out; but the holes should be prepared in a similar manner, namely, a cone formed in the centre of the hole, and any roots that shake out readily laid evenly downwards. The whole of the ground being broken up, it is unnecessary to open large holes, but they should be large enough to spread out the roots in a proper manner. The layering of trees and shrubs should be done during the month. This is a much quicker way of securing plants of certain kinds than from seeds, as fair-sized, well-rooted specimens may be grown in one season. The following root readily in this way—ficuses, cantuas, escallonias, laurels, azaleas, boronias, ceonothus, diosma, euonymous, hibiscus, ligustrums,, magnolia, neriums, and veronicas. It is seldom necessary to tongue these layers or remove any bark, because if buried at the deepest part, some 6 in. deep, and kept constantly moist either by rain or artificially they invariably root well. All evergreen edgings to paths, &c., should be put in, as box, lavender, fairy rose, &c.; if cuttings are used the lines should be dug deeply and 18 in. wide, and the cuttings, which are made 6 in. long, put in 4 in. deep. Tread them in firmly and water thoroughly.

Agricultural Gazette of N.S.W.

HERBACEOUS PLANTS FOR THE OPEN BORDER.

By William Reid.

I don't think there is a more interesting class of plants than hardy herbaceous plants. They give us a show from earliest spring until hard, freezing weather sets in. They never get monotonous, as every week something different comes into bloom. The ideal place, in my opinion, for a herbaceous border is at the edge of a lawn with a background of shrubbery. In such a position the plants show to the best advantage. Also they and the shrubs harmonise well together. But a border alongside a wall, or fence, is also an excellent position. A herbaceous border around a kitchen garden looks well, too, but in such a place I would drive in posts and have a trellis of wire behind the border, so that I could grow all the different varieties of vines.

A herbaceous border does not show to good advantage unless it has a background of some kind. In planting the border I would endeavor to plant each kind in masses or groups by themselves; the effect is more striking than having the plants all mixed up.

The preparation of the border is another very important matter; unless a good depth of good soil is afforded good results will not be secured. To have good success one should have at least 2 ft. of good soil, with perfect drainage. If the soil is of a sandy or gravelly nature, I would dig it out and replace it with good soil, using plenty of good, rotten manure in its preparation. I am well aware of the fact that a good many hardy plants like light, sandy soil; but, in general, they all flourish in good, rich ground.

In planting the border, I would prefer early Fall for the work, with the exception of such plants as candytufts, gaillardias, helianthus, also some of the sunflowers. My experience has been that sometimes these get winter killed transplanted late in the season. By planting at the time mentioned they will have a chance to get good root-hold before hard, freezing weather sets in. And they will make a better showing the following summer than if planted in spring, for the reason that sometimes we get a hot, dry spell of weather early in the season which gives them quite a check.

In regard to covering the border for the winter, my practice has been for a good many years, with good success, to spread good, rotten manure in between the plants, and level it off nicely in the spring with a rake. Leaving it on the surface helps to keep the ground moist and cool, and prevents the ground from baking; also tends to keep down the weeds.

But I would not cover plants of an evergreen nature with short manure, as they would be very apt to rot if the weather should be mild during winter. I would much prefer to use marsh hay, or anything of a similar nature.

To have the border look its best I would, by all means, at least once a week, go through it and cut off all dead flowers, with the exception of any that I wanted for seed purposes; this adds greatly to the appearance, and, besides, the most of them will bloom longer by doing so. Be sure to keep the hoe going to keep the weeds down. It is a very easy matter to keep down the weeds when they are small; a scuffle hoe is best for the work.

I would plant all the various kinds of spring flowering bulbs, such as winter aconite, snowdrops, scillas, crocus, fritillarias, chionodoxas, daffodils, and others. Not in hundreds, but thousands, of each kind by itself. They are more effective in masses than a few scattered here and there. And when they are through flowering I would plant hardy annuals, such as Phlox Drummondii, scabiosas, zinnias, marigolds, calliopsis, Dianthus chinensis, salpiglossis, and others. For that purpose I would make a sowing of the above named annuals about the second week in May.

I will now name those which, in my estimation, are the most choice of all the herbaceous plants. There are others equally as good, but it would take too long to describe them. About the first to bloom is the Iris reticulata. It is a bulbous plant, growing about a foot high, with violet purple flowers. Then we have the hepaticas, with white and pink flowers; they do best in a shady position. Arabis albida, or rock cress, is a low growing plant, with white flowers, very pretty for the front of the border; easily raised from seed or division. Alyssum saxatile compactum is another beautiful plant with yellow flowers; a mass of it is very effective. It is easily raised from seed. Phlox subulata, or moss pink, is a handsome evergreen creeping plant; there are several varieties, and all are beautiful, being very easily raised from cuttings in September. Planted in a shady place, they root in a short time if kept moist. The Dielytra spectabilis, or bleeding heart, is one of the handsomest of all the herbaceous plants, blooming early in spring, with beautiful foliage, and racemes of heart-shaped red and white flowers. The variety eximia is a dwarfer plant, with fern-like foliage and smaller flowers, blooming more or less all summer. Corydalis nobilis is another beautiful plant belonging to the same order, with handsome foliage and yellow flowers. They are readily increased by division. The aubretias, or purple rock cress, are beautiful low-growing plants, with various shades of purple and pink flowers; easily raised from seed. The epimedium is another early blooming plant, very pretty for the front of the border, with pink, white, and yellow flowers, increased by division. The doronicums are very showy plants with large yellow daisy-like flowers, growing about 2 to 3 ft. high. The geums are very pretty, with red strawberry-like flowers; the double varieties are the best. They are best raised every year from seed, as they are liable to rot out during winter. The trollius, or globe flower, are handsome, easily blooming plants, with beautiful foliage and globe-shaped, yellow blooms; height when in flower, about 1 ft. Then we have the early flowering Veronicas, cerenoides, and rupestris, low growing plants, with blue flowers lasting quite a long time. There are other varieties of veronicas which bloom later in the season but I think the best of all is Veronica longifolia subsessilis, which flowers about the latter end of August and September. It is very easily raised from cuttings or by division. Aster alpina is another beautiful dwarf, with large blue flowers and yellow centre, growing 9 in. high, flowering about the third week in May. It does best in light, sandy ground; in heavy soils it is very apt to not come out during summer; at least, that has been my experience. It is readily increased from seed, or by division. I was almost forgetting to mention the saxifraga—that is, the broad-leaved section. They are about our first plants to flower in spring, and very often they get nipped by late frosts. I would also be sure to include the armerias, or sea pinks. They are fine for the front of the border. Armeria maritima and A. formosa are both good, with bright pink flowers. One of the most beautiful spring-flowering plants is the Iberis sempervirens, or candytuft, with flat heads of flowers of the purest white; easily raised from cuttings or by division of seed.

And now we come to the Iris family, which is often called the orchid of the garden. They are all very ornamental, and present a wide range of delicate colors, flowering from early spring to the middle of July. The German iris are all grand, blooming in May and the early part of June. They all do well in ordinary garden soil. I would advise not to plant them too deep; otherwise they are liable to rot, if the ground is too rich. Then we have the Japan iris, which are considered by many to be the best of all, with large single and double flowers, often 9 to 10 in. in diameter, with a great variety of colors, from purest white, through all the various shades of purple, lilac, pink, and deep maroon. They like rich, moist ground, and, if possible, I would give them plenty of water when coming into bloom. They are better for being transplanted every three or four gether. I prefer to transplant them about years; unless that is done they die away in the centre and eventually die out alto- the latter end of September.

No garden should be without the different varieties of lychnis; they all do well in full sunlight, are of the easiest cultivation; but my experience has been that some of them like to be transplanted about every two years or so, especially Lychnis flos-cuculi and L. viscaria splendens floreplena. September is a good time for dividing them. I think the two varieties named are the best. But, of course, we cannot get along without L. chalcedonica and L. Haageana. The latter embraces quite a variety of color, from purest white through all the various shades of red, pink, and crimson. The two varieties named are readily increased from seed.

The spiræas are a beautiful class of plants, doing best in partial shade in moist ground. A few of the best varieties are S. aruncus, S. filipendula fl. pl., gigantea, venusta, palmata, ulmaria, fl. pl.

Another very showy plant is the Thermopsis caroliniana, growing about 4 ft. high, with clover-like foliage and spikes of yellow, pea-shaped flowers. After being planted I always found it best to disturb them as little as possible. To increase your stock the best way is to raise them from seed sown as soon as ripe. They require staking. Campanulas are another very beautiful class of hardy plants; a good many are evergreen. There are also some I would not care to plant in the border on account of their weedy nature. Campanula carpathica, white and blue, is very choice for the front of the border; so is the C. rotundifolia (blue bells of Scotland). C. persicifolia, white and blue, double and single, are very handsome, growing from 2 to 3 ft. high. The above-named varieties are raised from seed and by division. We must not forget the Canterbury bells, Campanula media, which are biennials.

The digitalis, or foxglove, are beautiful, tall-growing plants, suited for the back of the border. I have found it best to raise them every year from seed, and treat them the same as Canterbury bells, as they seem to have a habit of dying out after flowering. But any plants that do survive the summer I would cover up for the winter, and they will make a glorious showing next season. Sweet Williams are capital subjects planted in masses near the front of the border; are easily raised from seed, but be sure you get a good strain, and sow some every year, as they, too, have a habit of dying off during summer. They require covering for the winter. Aquilegias, or columbines, are charming plants with a great variety of colors, including white, rose blue, purple, yellow, and scarlet. A. cœrulea, the Rocky Mountain columbine, is one of the best, with blue and white flowers. A. chrysantha is another good variety with yellow flowers, about the latest of all to flower. A. Skinneri is another good variety, with red and yellow flowers. There are a great many more varieties too numerous to mention. It is best to raise some every year from seed, sowing in spring, as a good many of the older plants die out during summer.

Peonies are among the most beautiful of all the herbaceous plants for the garden, very stately in their growth. Their flowers are very fragrant, and the colors are simply grand. No garden should be without a good collection of them; besides, they do well in the shade, where other plants would not grow. I think one of the best, also one of the oldest, varieties and earliest to flower is Pæonia officinalis, double dark red. Seen from a distance, the effect of this is simply grand. I have found that September is the best time to transplant peonies.

The delphiniums are another very desirable class of plants for the garden. They are mostly tall growing, and are of very easy culture. From seed sown in spring they will bloom the summer following. But of late years they have been attacked with a disease which cripples the foliage and flowers, rendering them worthless for cutting purposes. I don't know of any remedy for it; but my plan has been to dig up the plants attacked and throw them away.

The Oriental poppies are very showy plants, with handsome foliage and large flowers of various shades of red. A clump of them seen from a distance is very effective. After they are through flowering, the tops can be cut down and annuals planted in their place. The Iceland poppy, Papaver nudicaule, is very pretty, too, with yellow, orange, and white flowers. They are much dwarfer growers than the Oriental poppies. The gaillardias are very important plants, with red and yellow flowers, blooming all summer until late fall; they are very easily raised from seed. It is best to cover them for the winter; and I would not advise to transplant them in the fall, as they are apt to rot out during winter. Gypsophila paniculata is an elegant plant, growing about 3 ft. high, with small white flowers, and grand for cutting purposes; very fine for mixing in with a bunch of cut flowers, giving them a nice, airy effect. It is raised from seed, and when once established should be left alone, as the plants don't like being disturbed. Coreopsis lanceolata is another fine plant, blooming all summer, with yellow flowers. I would advise cutting off the dead flowers once a week; otherwise the plants won't bloom so freely. To keep up stock of them, sow some seed every year, as the old plants die out occasionally. Clematis Davidiana, integrifolia and recta are fine for the border. C. Davidiana is readily increased by division. The other two named varieties can be raised from seed. Sown in a cold frame, they will come up the next spring.

If I were limited to one class of hardy plants I would choose the Phlox decussata. They are grand, and have such a variety of colors, flowering all summer. By cutting off the seed vessels they branch out from the stems and keep on flowering. They are easily raised from cuttings, seed, or division. I used to sow the seed, from selected flowers, in a cold frame, and they would all germinate and come up in the spring. Then I would transplant the seedlings, and all of them would flower the same season. Any poor varieties I threw away and kept the good ones. By practising this method one will gradually get a fine collection in a few years.

The helianthus, or sunflowers, are plants of very easy culture, with showy yellow blossoms, but there are some of them I would not care to have in the border on account of their weedy nature. A few of the best are H. multiflora, with large single flowers. H. multiflora fl. pl., with double yellow flowers, I think, is about the best of all. The H. Maximilliana grows about 8 ft. high, and the latest of all to flower. I prefer to transplant them in the spring. The rudbeckias are very similar to the sunflowers. R. golden glow is a tall growing plant, with double flowers, requiring staking. R. subtomentosa is a fine variety, growing about 4 ft. high. R. speciosa makes a fine display with its yellow blooms and dark centre. R. maxima, with glaucous foliage, grows from 4 to 6 ft. high, with large, yellow flowers and a dark cone-like centre.

Stokesia cyanea is a beautiful, late blooming plant with deep blue, aster-like flowers. To have it do well it requires a well-drained situation, in sandy loam; otherwise, it is apt to die out during winter. It can be raised from seed. Scabiosa caucasica is another beautiful plant, with blue flowers, requiring treatment similar to the stokesia.

The monardas are very showy plants, with brilliant scarlet flowers; a mass of them seen from a distance is very effective. They are of very easy culture, doing well in the shade or full sunlight.

Platycodons, or Chinese bell flowers, with blue and white bell-shaped blossoms, are fine for the garden, growing about 2 ft. high. They require staking. The best way to increase them is from seed, as they are hard to divide. The boltonias are very useful plants for the garden, fine for cutting, resembling asters, but much more refined in appearance. B. asteroides grows about 6 ft. high, with white flowers. B. latisquama grows from 3 to 4 ft. high, with delicate pink flowers. They can be increased from seed or division.

Physostegia virginica is a fine late blooming plant, with showy spikes of pink flowers; it grows from 4 to 5 ft. high, and is fine for cutting. Increased by division. The Anemone japonica gives us a fine show when flowers are getting scarce. Valuable for cutting, lasting a long time in water. The plants are not very hardy in heavy soil. It is best to give them good protection. Tritomas, or red-hot poker, are grand late-blooming plants, with showy spikes of red and yellow flowers, very effective in masses, but they are not very hardy.

THE ROSE.

Roses flower so continuously in this State that it is possible to secure blooms almost every day in the year. This can be done by any one who is not afraid of work. It is only necessary to put a little time, labor, and money into the Australian rose garden to reap a harvest of flowers such as cannot be excelled in any other part of the world. Australia is essentially a rose growing continent. The long spells of summer and sunshine, with the delightful silvery days of autumn, and the soul-stirring, but all too short a springtime, provide one long season of gaiety and life for the rose.

If any nation should be famous for its roses, Australia is surely that nation. There is nothing, other than the lazy ways of our people, that keep us from being among the first of the world's gardeners. Everything possible in the way of climate has been given to us, and without stint; we have soils and situations equal to anything on the face of the globe, as mild as one could wish, or as hot as Arabia; and we have men and women among our rosarians just about as skilful as any of those who grow roses on the other side of the line. To many folks this may read like a bite of conceit. It is true all the same, conceit or not. We are not behind in the matter of growing the flowers; where we loose ground is in the raising of the newer varieties. But this will be altered as time goes on. As yet we are only in the infancy of our rose growing. Some day Australians will be raising varieties which will find their way to the other side of the world. We have made a name among dahlias with the productions of Mr. G. H. Kerslake that will live for a long time, and have also done about as well with the colonial raised chrysanthemums. Some day our men will get into the right line of rose hybridization, and then our time will come. For the present we must wait, both for the rose prophet, and for an increase in the population as well. Without a few more millions of people we have no hope in competition with the English and Continental growers.

Still, as we are we are doing well. The rose interest in Australia is a live one. Let us keep it alive, let us make it grow, until every householder in the land sweetens his home plot with one or more of the best of all flowering plants.

....

SELECTION OF 24 ROSES.

For a beginner who is in search of a good, reliable company with which to make a start in the fascinating work of rose garden making, the list published recently by the "Daily Telegraph" is just the thing.

No grower, whether he be a beginner or a veteran, can afford to be without any one of the undermentioned roses. It is quite an easy matter to turn out several of those named and to substitute others, which are thought more highly of by individuals here and there, but, for general purposes, the list is hard to beat.

If you have not the whole of them, see to getting them at once. We can recommend every rose; they are all worth a place anywhere where roses are grown.

Out of 356 rose names submitted, the following twenty-four topped the pole. You cannot do better than begin with these, and secure other favorites afterwards.

The following twenty-four have been chosen: Kaiserin Augusta Victoria, Maman Cochet, La France, Marie Van Houtte, White Maman Cochet, The Bride, Marechal Neil, Frau Karl Druschki, Souv. de Therèse Levet, Prince Camille de Rohan, Madame Jules Grolez, Perle des Jardins, Niphetos, Madame de Watteville, Countess de la Barthe, Belle Siebrecht, Devoniensis, Madame Abel Chatenay, Bessie Brown, Gruss an Teplitz, Reine Marie Henrietta, Madame Lombard, Earl of Dufferin, Sunset. The list is an excellent one. It is really the best that has ever been prepared for New South Wales, and as such may be commended to the notice of the great and ever-increasing company of rose-growers.

....

ROSE PRUNING.

The pruning of the rose is a stumbling block to most amateurs. There is no reason why it should be so, as there is little or no difficulty in pruning any of the varieties generally grown. Many of the professionals have done their best to make this matter an impossible business to the beginner, by surrounding the pruning with a sort of haze, through which the eyes of the amateur are unable to penetrate.

But, little by little, we are overcoming this feeling. As time goes on, and as roses are more freely grown, it becomes all the more necessary for the grower to have a knowledge of the bushes under his charge, so that he might be able to attend to their every want without ever calling in the aid of the specialist. Do everything in your power to become a specialist yourself. It will not take long, if you will but keep your eyes open. A little practise makes the hand very sure, whether it be in the matter of counting sovereigns or pruning roses. Make up your mind that you will learn to prune, and prune you very soon will.

But first let us understand what pruning is for.

It is necessary for three things: For keeping the bushes in order, for preserving the quality of the flowers, and for cutting away all the old and decayed wood.

Let us take the first reason: To keep the bushes in order. To plant a rose bush to-day in a position to its liking, and to leave it for years without any attention whatever, and to return in three years time, would find it endeavoring to assume a tree-like state. It would grow and grow until it had reached the limit of rose growth. That limit would be governed by the nature of the rose, and the strength of the soil. If it were a strong-growing variety it would probably reach 7 or 8 ft. But in doing so it would certainly lose a lot of the charm of a well-attended rose bush.

To have to mount a ladder every time you wanted a basket of roses would hardly be to the liking of the majority of present day growers. Pruning, as we said before, helps to keep the roses from getting out of hand.

In our second reason for pruning, we have one that is ever so much more important: To preserve the quality of the flowers. This is really the beginning and end of rose-growing.

Any one who loves a rose would at any time rather have a well-formed flower than one that had lost all its beauties, either through malformation or neglect. Every grower makes an effort to get a result that will give an adequate return for the time and labor spent in the garden. If the flowers are good, the return is a great one; if they are bad, the labor has, in a measure, been thrown away. Only by getting the best that is in the plants is the work of rose-growing worth doing.

The act of pruning is the means by which man keeps the rose to itself. If it were allowed to run its own race, the good qualities would very soon be lost in the many bad habits which would soon take the upper hand. Roses, like most other garden flowers, have undergone so many processes of improvement that unless they are always kept on their very best behaviour, they quickly return to the coarse ways of the wild briar. Every one who knows anything of the laws of the vegetable world must know the tendency of all flowering plants. It is a backward one, which makes for the savage state which the plant knew before it, or its parents, were taken in hand by the men who guided the growings on brighter and better lines. The wildness of the wilderness is that which the average rose plant is making for. Left too long without a pruning, it will get one step nearer to the ideal which it has set itself sooner or later to gain.

It is only under the guidance of man's hand that any gain or advance is made.

Pruning, then, is, as you will perhaps now be willing to admit, a very important operation in the culture of the rose.

If you are still of a contrary opinion, try the matter for yourself. Neglect your champions for five or six seasons, and you will soon discover the drift they are making on their own account. By the time you have made the discovery, your roses will probably have lost a little of their character, and you, too, will have gone somewhat behind.

Our third reason is that pruning keeps the plants free of all the weak and decayed wood. This matter is so plain that it needs no explaining. Thin pieces of wood, such as frequently grow in the centre of the bushes, should be cut out at every opportunity. They do no good, and only rob the plants of so much life that might be put to a better purpose. Cut them out, and cut the dead pieces with them.

There is one thing which the rose pruner should always keep well in mind—to cut to an outward eye. Lead the new growths outward. They look better, and there is no danger of the one rose rubbing against another. Roses that are allowed to rub are, as a rule, not worth cutting.

Refer to our last number for the illustration which explains what an eye is.

What to Use in Pruning.

One frequently hears a question asked in reference to the proper pruning instrument. Which is the better, a pair of secateurs or a knife? Everything depends on the one who is pruning. If you know how to use either, you can take your choice. Generally speaking, we like the secateurs best. In the hands of a lady who is beginning her pruning, a knife is not a very nice instrument to handle. One is so apt to tear one's hands on the thorns in making the cuts. In cutting an outside shoot there is no difficulty; it is when one comes to work right in the centre of an old bush that the difficulty is made plain. Old shoots take some cutting, and old thorns tear very nastily. Leave the knife for the days when you feel that you are no longer a novice. Many people will tell you that nothing but a knife, shonld ever be used. "Circumstances," as you know, "often alter cases." Still, there are some positions in which even an expert would hesitate to use anything but a pair of pruning shears.

One of the contentions of those who advocate the knife is that using the shears, pinches, bruises, and injures the bark of the rose. There is no doubt that it does—when the shears are not used in the proper way.

With a sharp pair of secateurs in hands of a man or woman who knows how to use them, there is no injury and no pinching. Injury only follows when the secateurs are not used in the correct way.

"Which is the correct way?" some one asks.

Let us see if we can explain this, so as to make ourselves understood. Bring your secateurs. It is easier to make an explanation when the tool is handy. Take them in your right hand. What we have to say only has to do with the sets with a single blade. The double-cutters are above suspicion, and can only be used in one way—the right way. Having taken the instrument in the right hand, let it spring open. This will show you that one (the lower) handle, carries the cutting blade, and the top handle the part against which the blade makes the cut.

So as to avoid mistakes, we ask you to take a further look at the blade, the left side of which is quite flat, and the right side ground off to an edge. Itis this right, or ground edge, that should lay next to the rose eye when you are cutting. Be quite certain that you have laid hold of our meaning, for on this lies all the rights and wrongs of rose pruning. The ground edge is the cutting side, the other one is the cutting face, intended to be kept away from the eye. If you use the ground edge you cut to within a hair's-breadth of the eye; reverse the cutters, and you cannot get within a quarter of an inch of the point at which you wish to make the cut.

It is on that quarter of an inch that the bruise is made when the secateurs are not properly handled. It will take you a little time to get into the way of making the cut in the right way, but when you have mastered it, you will admit that there is a lot to be said in its favor.

Here is another explanation that might simplify matters. When cutting a shoot that comes out towards your right hand, you cannot, if the cutters are held correctly, do anything but cut properly. The ground side of the blade must lay properly; it is when you are cutting a shoot that comes towards your left hand that you are apt to cut badly. To get over the difficulty, twist your wrist, so as to bring the handle on which your fingers are laying up to the top. Make the cut with the secateurs in this position, and you will never go wrong. Turning the wrist brings the ground side of the blade right against the eye of the rose.

When to Prune.

A lot depends on the weather, and a lot more on the situation of the rose garden. A very safe rule to follow is to prune when you think you are not likely to have any more frosts.

Could you be sure that the weather is not likely to change, there would be no trouble in fixing the time. But you know little or nothing about the weather which lies a week ahead. To a certain extent you must take a risk and prune according to your own fancies. If you have no "fancies," set about getting some. If you are a suburban resident anywhere near the water, the second week in July will be about the right time to begin the rose pruning. If you are on the highlands of the Milson's Point line or in any of the Eastern suburbs, the last week in July or the first in August, will be in plenty of time. Should you be living on the Mountains, the middle of August, or nearer the end of it, should come in sight before you begin. If you aer not in either of thes places, set about hunting up a rose-grower in your district, asking him the time he begins his work. This is the safest plan. It might be possible for us to sit down and say that pruning in such and such a district should be done at a certain time. Possible, or not possible, it would not be a very good plan. The time to prune will vary with the season, and vary very much; so for this reason we think it best for you to ask a local grower whom you know has made a success of growing his flowers.

"The Amateur Gardener."

CARNATIONS.

WHY ARE CARNATION GROWERS MORE PROGRESSIVE THAN ROSE GROWERS IN AMERICA?

I believe that, as a class, the carnation growers are more liberal, more energetic and determined to push their flower to the front than are the rose growers. Again, the rose grower has had the advantage of having a certain amount of self-conceit owing to the fact that the popularity of the rose has been of long standing, while the carnation grower knew that in order to get a standing he had to get out and hustle and make things ring. Again, the rose grower is working under an average temperature ten degrees higher than is the carnation grower. Now you know that inhabitants of tropical climates are much less energetic than those of temperate climates. The temperature of the carnation house approximates a temperate climate, while the temperature of the rosehouse approximates the tropical climate; consequently, I consider the rose grower a tropical inhabitant and the carnation grower a temperate one.

Again, the carnation grower has the advantage of having a better following than has the rose grower when you consider it from one point of view, and that is, that it is more plastic under the hybridiser's management, and it is much easier to produce new varieties of carnations than it is to produce new varieties of roses.

Again, the facility with which the general public has accepted the improvement in the carnation, and the promptness with which it has awarded the efforts of the carnation hybridiser has acted as a strong stimulus to the carnation men throughout the country, and infused into them a degree of energy and progressive spirit that has carried them on enthusiastically in their work, and has produced the splendid results in increasing business which has benefited the entire florist trade—grower, commission men, and retail dealer alike. Further than this the deponent saith not.

This matter was creative of a very lengthy discussion, participated in by Messrs. O'Mara, Butterfield, Wheeler, Lenker, Scott, Wallace, Harry May, Endgren, and others, in which the rose grower and the carnationist each found his champions. It was pointed out that the carnation men had the advantage of the rosarian in the ease with which new varieties could be secured, creating greater interest in the divine flower by commercial florists, at least. On the other hand, it was stated that the rose man did not advertise his goods, through public exhibitions, as largely as he might do. It was also shown that the men who had attempted the cross-fertilization of the rose, such as E. G. Hall, John Cook, M. H. Walsh, Jackson Dawson, and W. A. Manda, had secured results which showed great improvement over varieties imported from Europe. Mr. Wheeler did not believe the carnation men were really more progressive than the rose men; the former had a flower that responded more readily to progress than the rose. The discussion was an interesting one, and instructive in so fa ras it showed that the rose men were inclined to rest on prior laurels and did not seize the advantage afforded of displaying their goods to the same extent as did their brethren who cultivate the divine flower; advertising being considered a mark of progress, whereas non-advertising demonstrated a lack of the progressive spirit.

James T. Scott replied to the question "Is Floriculture More Advanced in This Country Than in Europe?" He spoke as follows:

Is Floriculture More Advanced in America than in Europe?

The question is a somewhat knotty one. No matter how well disposed one may feel toward the land of his adoption, there is that something voiced in the words of Sir Walter Scott:

"Breathes there a man with soul so dead,
Who never to himself has said
This is my own, my native land."

An opinion thus given is liable, therefore, to be biased in a degree, no matter how honestly we may endeavor to face the question.

If we should confine ourselves solely to commercial floriculture, the answer would be a negative one. There is no country in the universe where flowers are grown (especially in the winter months) for the millions to such perfection as they are here, but the range of variety is in a great measure restricted. If we eliminate the rose, carnation, and violet, there would be little left indeed; and looked at from the broadest standpoint, these three items could scarcely be said to cover the field of floriculture. Financially, this country is able to support these luxuries better than they are supported in Europe. The working classes over there find it a hard enough struggle to make money enough to keep body and soul together, without any of these added luxuries. Even if they had the money, it would be impossible to supply these grades of flowers at the same cost. The winters over there are cold and dull, with scarcely any sunshine, and during the summer it is necessary to keep firing constantly. Under these conditions it is impossible to produce the same grade of flowers at the same cost as we do here. The wealthy classes over there mostly rely on their own greenhouses for all their flower supplies, and the commercial florist, as we know him, is scarcely known on "the other side" at all. Covent Garden is largely a plant market, although during the early spring months lots of bulbous stock finds its way there from the Scilly and Channel Islands and from the south of France. The modest flower girl is found on the London streets in spring and summer, but there is not enough money in the operation to entice the Greek; and the millionaire commission man can only be fattened in such a broad and wealthy country as America.

To every European the cultivation of roses, carnations, and violets as done in this country is quite a revelation, but here it ends, and floriculture in its broader sense seems to be largely sacrificed for this. Moreover, the tendency is to run to specialities, most times to carnations or roses alone, or vice versa, and the floricultural training of the young man in the business is therefore but superficial. No doubt he may be able to make just as good a living as if his knowledge were broader, but, from a floricultural standpoint, his training has never been finished. There are, of course, many exceptions to this as there are in anything, but those who have surmounted the barrier have done so from energy and strength of character in spite of the system, rather than because of it.

There are a few private places in this country where floriculture is just as far advanced as it is in Europe, instances: at Gould's, Rockefeller's, Untermyer's, Borden's, Ogden Mills', Dinsmore's, D. Willis James', J. Crosby Brown's, F. L. and Oakes Ames' estates, Percival Roberts', Wanamaker's, several estates in Lenox and Newport; but the majority of private places here are run too much on a semi-commercial basis, for what can be got out of them; and everything is figured down to dollars and cents—merely a place where the floral essentials necessary for society events are produced more conveniently and cheaper perhaps than they can be procured in the open market; or because a whim of fancy or society dictates demand that all up-to-date people must have these things to be in the height of fashion; just as the up-to-date spirits demand that the wealthy must own fast horses or an expensive automobile. They largely own these things from a spirit of caprice to excel and outdo others less fortunate in the possession of the world's goods. A big bunch of flowers appeals to any nature, however primitive, but how few of even those who own greenhouses will take up one small flower in their hand and admire it for the sake of the flower itself? In the language of the poet:

A primrose by the river's brim
A yellow primrose is to him,
And nothing more.

How few appreciate the spirit of the poet Burns as he was about to turn under with the ploughshare a modest daisy, the first harbinger of spring:

Wee, modest, crimson-tipped flower,
Thou's met me in an evil hour,
For I maun crush among the stoure,
  Thy tender stem,
To spare thee now is past my power,
  Thou bonnie gem.

If we were to leave out the men who are directly interested in floriculture here for a livelihood, and the wealthy whose case has already been dealt with, what would be left? The poorer, everyday working people have no love for rural beauty, and the flowers that clothe the roadways have not for them even a passing interest. How different from the old world homes, where every cottage has its garden; where the roses and the honeysuckle mingle with the morning glories against the whitewashed walls of the humble dwellings; where the pathway that leads to the door has a border of flowers on every side! The edging may be of boxwood or oftener of the common saxifraga (or London Pride), or double daisies, or, sometimes, armerias sea pink). Cerastium tomentosum (snow in summer) In the border behind, the snowdrop appears before the snow has left the ground, followed in quick succession by crocus, daffodils, aubretias, grape hyacinths, primroses, iris, polyanthus, wallflowers, adonis, campanulas veronicas, starworts, woodruff, pyrethrums lupines, delphiniums, monkshood, ranunculus, anemones, phloxes, peonies, pansies, violets, trilliums, potentillas, and other things far too numerous to enumerate. In these small garden spots they contrive to have things in bloom from early spring until late in the fall, when the Christmas roses have to be protected from the keen biting winds with spruce branches. Flowers to these humble old world cottagers are a source of everyday delight. Few plants are bought or sold; their incomes deny this. But a spirit of good fellowship, largely enhanced by mutual tastes, enables them to barter backward and forward, and newer things thus find their way gradually into every garden. The children are reared in this atmosphere; they learn the names of the various flowers as they come and go; as other children become familiar with the names of the various household articles. As a boy, I could name every flower that grew in my father's garden, as well as every tree which grew in the district, and I was no exception. When the day's work is over men turn to their gardens for recreation; often also, from necessity, for all grow their own vegetables, which otherwise they would have to go without, their income often being insufficient to spend on needed staples. In every cottage window is to be found a wealth of bloom; it may be of geraniums, pelargoniums, or fuchsias only, but always enough to make the home look cheerful and bright. Every little country village has its annual flower show, and the keenness of competition surpasses, in its own small way, a Madison-square Garden Exhibition. The beauty of it is, that all are competent judges, and the minutest details are keenly scrutinised.

The love of flowers, and the love of the beautiful in nature, appeals not to those whose thoughts are sordid, whose one desire is to make money or to shine before the glaring footlights of a superficial society.

This is a comparatively new country, and men have been busy up till now developing it. Liberty loving subjects of all nations have flocked to these United States, where aristocratic rule is unknown, and where one man is as good as another. Again, the spirit of Burns prevails: "A man's a man for a' that." But our work is just beginning. Ours is a missionary calling. There is here a fresh field for labor. There is here the material to work upon. There is here the wherewithal to work with; and if the work remain unfinished it will be largely our fault.

Is floriculture in this country as far advanced as it is in Europe? No; not yet.

Questions to be answered next meeting are: "Are the street merchants and pedlars beneficial or detrimental to the florist business from the standpoint of the grower, the retailer, and the commission man?" "What are the essential qualifications of a judge of cut flowers and plants?" "What are the most desirable features in a rubber plant?" and "Who is Job?" At the next meeting also there will be a display of bedding plants, and, probably, a talk on the subject by growers. An amendment to the by-laws, relative to the duties of the secretary and treasurer, also to increase the former's salary, will be discussed at that time.

CLIMBING PLANTS.

A climbing plant we would strongly urge our readers to grow is Solanum Wendlandii. It has become very popular, and deservedly so, for a more lovely flower of a lavender blue one seldom sees. It is very free flowering, and continues in bloom through the summer months. It looks well trained on a tripod among the shrubs, or over an arch, against a fence, or anywhere so that the flowers can be seen.

It is deciduous, and very easily propogated by taking cuttings during the months of June and July. Scarcely one will miss taking root if cut from the parent plant with a heel, and inserted in light soil. There is a very large family of the Solanum suitable for climbers, but in addition to S. Wendlandii, we will mention S. Jasmanoides Alba, and Aurea (white and yellow), and S. Seaforthianum (pink). They are natives of South America and Barbadoes respectively.

Mandevilla Sauveolens is a well-known climber, bearing clusters of pure white and sweet-scented flowers. It is easily cultivated. Young plants will spring up from seeds—blown about from the pods—in every direction. Native of Buenos Ayres.

Physianthus Albens is another good evergreen climber from Buenos Ayres, and resembles the Stephanotis somewhat, the flowers being white. It is a capital plant for trellis work or fences, and does well in almost any position. From Buenos Ayres also comes that splendid climber Bignonia Tweediana. This plant will ramble a great distance, and delights to entangle itself on mesh wire. Early this summer saw it growing on mesh wire, which was erected about 4 ft. above a dividing fence, and from end to end it was a mass of bright yellow flowers. Over old tree stumps, rough stone walls, and fences, this plant will ramble, and, being very floriferous, it makes a fine show.

There are a great many varieties of Bignonia, which are synonymous with the Tecomas.

"Johnston's Garden Dictionary" classes both in the same order, the only difference being in the "partition of the fruit."

B. Venusta is one of the very best of climbers. It flowers during the winter months, and is laden with bright orange-colored flowers. Any position will suit it if well exposed to the sun. For lattice-work it is unsurpassed, and it does well on the roof of any outhouse. We can well recommend this plant to our readers. Native of South America.

B. Rosea is a summer flowering variety, bearing trusses of fine, rose-tinted flowers, and hails from South Africa. It is certainly deserving of a place in any garden.

A very rare but beautiful creeper is Bignonia Chere're, or Chirara, from Guiana. The growth of this plant resembles the Cobea Scandens, but bears flowers of a long tube shape, and of red, orange color. We would like to see it more extensively cultivated, as it thrives well about Sydney, in sheltered positions.

B. Lindleyana, bearing lavender colored flowers, is a first-class climber. A few days ago the writer was having a dispute about the correct name of this plant. My friend declared it to be B. Laurifolia, or laurel-leaved. However, the plant under discussion bears a lavender-colored flower, so those who wish to grow it—and we strongly recommend it—will not go wrong if they purchase Lindleyana, as catalogued by our nurserymen.

Hoya Carnosa (the wax plant from Asia), is worthy of attention. It bears a very pretty flower, which is rather difficult to describe, and thick fleshy leaves. H. Bella is much smaller, both in foliage and flower; the latter is pure white, with a purple centre.

The Ampelopsis (Virginian creeper) should be grown by those who are fond of autumn tints. There are several varieties of them; but our preference is A. Veitchii Purpurea. They will cling and grow over rough stone walls, or up the side of buildings, and as autumn approaches the foliage changes to a beautiful red tint. Most of these come from North America.

The Passiflora (Passion Fruit) are too well known to need comment, their rapid growth and usefulness for covering unsightly fences is often demonstrated; but we must mention the Tacomas, which are closely allied to the Passifloris. All the Tacomas are good, but we have a strong liking for T. Van Volxemu. The flowers of this variety are a glaring crimson, hanging suspended on a slender stem. It is a very rapid grower, and we often wonder why it is not more in cultivation. It is a native of New Granada.

Ficus Stipulata is a well-known creeper for covering walls, fences, and the dwelling-house. It clings tenaciously wherever it is planted, and is well adapted for the purpose. When it begins to shoot out from the wall it should be kept constantly clipped; otherwise the leaves will grow coarse and unsightly. This fig is a native of China.

Mina Lobata is a splendid autumn-flowering creeper, bearing a mass of flowers of a red and yellow blend. It is an annual, and should be sown in the month of November, in the ground where it is intended to remain, although young seedlings will easily transplant to any position required. It is a native of Mexico, and should have a sheltered position.

Humulus Japonica, or the Japanese Hop, is a good climber for summer growth. It is a perennial, and grows very rapidly, but the flowers are not very attractive. The dark green foliage, however, stands the dry season well, and is refreshing to look at when all else is scorched and withered with the heat.

Quinqualus Indica is another valuable climber, the flowers are orange-red in color, and very sweet. It should be more extensively cultivated, as it does well here in sheltered places.

Ivies and Honeysuckles need no introduction; they are both old friends, and thrive well in suitable positions. They also revive old memories to those who come from the Old Country.

And so we could go on, as this subject is not half exhausted; but perhaps enough has been written for the information of the amateur, who is desirous of making a selection of this class of plants, without which no garden is complete.

We will conclude this article by giving the names of half a dozen good climbing roses: Cloth of Gold (yellow), Ards Rover (dark crimson), Climbing Devoniensis (creamy white), Rev. T. C. Cole (bright yellow), Reine Maria Henriette (bright rose), Climbing Souv. de la Malmaison (pale flesh color). All of these are free flowering and vigorous growers.

SMILAX.

TUFTED PANSY COTTAGE MAID.

Another season has again shown the high quality of this. The variety under notice is of the same character, in so far as the flower is concerned, as Countess of Kintore. As regards its habit, it is superior to others of the same type, and it also flowers freely. It is one of the earliest in the spring to bloom, and the autumn is well advanced before its display ceases. Its color may be described as alternately marked purplish-violet and pale lavender, sometimes almost white.—E. G.

HARDY WHITE FLOWERS.

The number of pure white hardy flowers is not great, but the following are among the most useful: In October and November, Narcissus poeticus and its varieties, and in the latter month Anemone sylvestris* and A. s. fl.-pl., Arabis albida fl.-pl, a new and valuable plant for cutting; in December Achillea mongolica, and in the latter part of the same month single white Pyrethrums, also Achillea ptarmica fl.-pl., and the variety known as the Pearl. In the same period, too, are the several varieties of Campanula persicifolia, all good and distinct. Then Galega officinalis alba for December and January, and Galtonia candicans in the latter, though perhaps the most valuable plant at this time is the white perennial pea (Lathyrus latifolius albus*), and with the new kind now being distributed—viz., L. latifolius albus grandiflorus —make a fine pair. At this time also flower the many kinds of white perennial Marguerites or Leucanthemums, of which there are quite a dozen that vary but little in size and form and in other ways. In autumn white-flowered subjects are not plentiful, but the best plant undoubtedly is Anemone japonica alba, and there are white forms of some of the Michaelmas daisies. Those marked with an asterisk may be obtained from seeds, but it is often quite a slow method and not always satisfactory.

THE DWARF FLAXES.

One character which the Linums present is a lightness and elegance of contour, to which the usually narrow leaves, slender stems, and delicate peduncles which support the individual flowers, all tend to contribute. This speciality is equally patent to those who are familiar with our commercial flax (Linum usitatissimum), whose cultivation extends over large fields in some parts of the country, and where, when in full blossom, such fields can be compared to nothing more appropriate than an azure sea, varied only in its lights and shades as it is gently rippled by the summer's breeze, or in the condition with which most people are familiar, as cultivated in its perennial form (L. perenne) as a border plant, possessing with neatness of habit a long continued blooming season.

Alpine Flax (L. alpinum).—This flax, growing only from 3 in. to 8 in. high, bears very large dark-blue flowers in summer. It is easily distinguished by its external sepals being acuminately pointed, and the internal ones obtusely pointed. A charming rock-plant, native of the Alps, Pyrenees, and many hilly parts of Europe, thriving well in warm well-drained spots on rockwork, in a mixture of sandy loam and peat. There are several varieties; L. austriacum is intimately related to it, and scarcely sufficiently distinct from a garden point of view.

Evergreen Flax (L. arboreum).—This is a neat, glaucous-leaved, dwarf, spreading shrub, with a profusion of clear handsome large yellow flowers, an inch and a half across. Although said to be rather tender in the colder parts of the country, it thrives wel lin others in the open air, even as a border plant, and in all is well worthy of a position on rockwork. A native of hilly parts of South-Eastern Europe, Asia Minor, and North Africa; usually propagated by cuttings. It is sometimes grown as a frame and greenhouse plant, but should be tried everywhere in warm spots on dry borders, banks, or rockwork. It begins to bloom in early summer.

Yellow Herbaceous Flax (L. campanulatum).—An herbaceous plant, with golden-yellow flowers in corymbs on stems from 12 in. to 18 in. high, distinct from anything else in cultivation, and well worthy of a place in collections of alpine and herbaceous plants. A native of the South of Europe, flowering in summer and flourishing freely in dry soil on the warm sides of banks or rockwork, and propagated by seeds. This is a very distinct plant from that usually grown as L. flavum, the leaves much narrower, more stoutly set, the plant altogether dwarfer and neater in habit, and seeding more freely. It also flowers more freely on much shorter stems.

The Taurian Yellow Flax (Linum flavum).—For many years L. campanulatum was known by this name, and so generally had the misnomer become established that even at the present day the mistake is frequently perpetrated; nevertheless the two plants are amply distinct. This species is an herbaceous plant in the strictest sense of the word, dying down annually to a short woody subterranean root stock, from which year by year arise several erect flowering stems, sharply angled and clothed with dark olive-green foliage, ovate, slightly cordate at th base and gradually narrowing upwards; the flowers, which are produced in February, being of a rich golden-yellow. It is perfectly hardy, and forms a handsome and long-lived herbaceous plant, and should certainly receive a larger meed of attention that it has hitherto done. By some authors it is named L. tauricum, being abundant in the Taurian Mountains, and, in fact, is generally met with in the upland meadows in Eastern Europe.

Red flax (L. grandiflorum) is a showy hardy annual from Algeria, with deep red blossoms. By successive sowings it may be had in bloom from October till April. Seed sown in autumn will give plants for spring blooming, and sowings made from September to December will yield a display through the summer and autumn. By sowing seeds in pots in good rich soil in summer, and plunging in a sunny border with plenty of water, plants may be obtained for the greenhouse or window during April and May.

New Zealand Flax (L. monogynum).—A beautiful kind with large pure white blossoms opening in summer. It grows about 1½ ft. high in good light soil, and its neat and slender habit renders it particularly pleasing for the borders of the rock garden or for pot culture. It may be readily increased by seed or division; it is hardy in the more temperate parts of England, but in the colder districts is said to require some protection. L. candidissimum is a finer and hardier variety. Both are natives of New Zealand,

The Narbonne Flax (Linum narbonnense).—A beautiful and distinct sort, bearing during the summer months a profusion of large, light sky-blue flowers, with violet-blue veins. A fine ornament for borders, the flower garden, or the lower flanks of rockwork, as may be seen by our illustration, on rich, light soils, forming lovely masses of blue from 15 in. to 20 in. high. A native of Southern Europe, distinguished from its relatives by its sepals tapering to a long point, its anthers being three times as long as broad, its long thread-like stigmas, and its large flowers.

Perennial Flax (Linum perenne).—A plant found in some parts of Britain, particularly in the Eastern counties, but very rare. Usually grows in dense tufts from 12 in. to 18 in. high, with bright cobalt blue flowers more than an inch in diameter, the stamens in some being longer than the styles, in others shorted, the petals overlapping each other at the edges. L. perenne album is also an ornamental plant, and there is also a variety with blue flowers variegated with white, known in gardens as L. Lewisii variegatum, but this marking is not very conspicuous or constant. L. sibiricum and L. provinciale are also included under perenne. Of very easy culture in common garden soil, it is a useful border plant, and may also be used in rough rocky places.

White Rock Flax (L. salsoloides) is a dwarf half-shrubby species, essentially a rock garden plant; its flowers, white with a purplish eye, reminding one of some of our creeping white phloxes. In the rock garden ,in a well-exposed sunny nook, the plant is hardy, and trails over stones, flowering abundantly. It produces seeds rarely, so that it must be increased by cuttings of the short shoots taken off about midsummer; these will strike freely, and make vigorous plants when potted in the following spring. L. viscosum, with pink flowers, is a closely allied plant. Mountains of Europe.

CINERARIA.

The seeds should be sown in a compost of 1 part of loam, 1 part of well decayed leaf mould, and sufficient sand to keep it porous. When they have made their second rough leaf prick them out singly into thumb pots, and as soon as the pots are filled with roots shift on into 3-inch pots; in a few weeks they will be ready for their final shift into 6-inch pots. For the last two pottings use a compost of 1 part turfy loam, 1 part leaf mould, 1 part well-rotted manure, and enough sand to keep it open, and mix it well together. Pot moderately firm, and when well established they delight in a plentiful supply of liquid manure and soot water. The plants should be fumigated every few weeks to keep down the green fly. I attribute my success mainly to growing them as cool as possible, just keeping the frost from them.

ORNAMENTAL AND USEFUL.

In many greenhouses the space underneath the stage is not utilised. In span-roofed houses with paths of fair width, and stages about 3 ft. high, plant Maidenhair Ferns underneath. Holes should be dug out 18 in. apart and about 8 or 10 in. in diameter and depth, near to the edge of the path, and the ferns planted in them in a compost of loam 2 parts, leaf mould 1 part, and sharp river sand 1 part. Occasional waterings with weak liquid manure from poultry manure or Clay's fertiliser when the plants are established will prove beneficial. Suitable plants are those established in 48 size pots, in need of potting on. These, if planted out, will grow with astonishing vigor and produce an abundant supply of fronds for cutting. Selaginella denticulata planted between makes a good carpet and finish to the arrangement. If slugs are troublesome, slices of carrot laid down and examined nightly form an excellent trap.

CANNAS WITH WHITE FLOWERS.

A writer in the Revue Horticole, in speaking of the efforts of hybridists to obtain a canna with pure white flowers, mentions the following sorts that have been offered in the trade as belonging to that section: Alba rosea grandiflora, white, dull rose; Ideal, rose white; Candeur, same color; Rosalba, white, lightly spotted rose; Apollon, straw, passing to pure white; Mlle. Fray, cream white; Alsace, greenish white; Seduisant, white, lightly spotted rose.

More recent varieties include: Mlle. Meriem Lombard, almost pure white; Albatros, straw, passing to white; Mme. H. Coufourier, white spotted rose; Poéte, straw, passing to white; Jeanne d'Arc, straw, passing to pure white; Miss Annyker, pretty cream, almost pure white; Mlle. Ant. Cresp, almost pure white; Flo-pure white; Bolue de Neige, straw, passing to white; Frau Maria Nagel, almost pure white; Valentine Delalande, pure white, with light rose centre; Le Lys, a dwarf plant, flower white, lightly striped with rose.

Says the same writer: "We hope that some day a truly pure white-flowered canna will be obtained with beautiful green foliage, or, what is better, purple black foliage. From a decorative point of view, the latter would be ideal."

PANCRATIUM MARITIMUM.

As the seedlings are now pricked off you had better leave them in the larger pans and transplant them again in early spring, when you should select the warmest site you possess, and there place a temporary frame wherein to plant the seedlings. Well planted, they will be safe enough till at least three years old, or even four years old. Let your frame be about 1 ft. deep, and give the light a sharp pitch to south or south-west. Make up the soil of the frame 6 in. above outside level, using old potting mould, if not better material is available, and abundance of sand or grit intermixed. Make this firm and plant the small bulbs in shallow drills at a short distance asunder. Keep the small bulbs quite close to the surface, with what roots they have in a straight-cut trench. From your description of the seedlings, you have the true plant; with age, however, the leaves will lengthen to 12 in. or 15 in., and nearly 1½ in. broad. If you consider you are quite favored in respect to climate, it is possible this species may do in the open, with certain modifications. The bulbs should be buried 3 in. deep, and planted in a sunny bed of well-drained loam and plenty of sand; for example, a narrow border against a warm wall, though even here a glass-frame would be infinitely better for them. This species is less hardy generally than P. illyricum or even P. equestre. Both of these grow and flower in certain parts of England in the open, but P. maritimum less so.

What is needed in the case of P. maritimum even more than the others, we believe, is an absolute rest in summer, when growth appears, as a rule. The growing and resting periods are controlled chiefly by the treatment accorded. This also will be responsible for the bulbs arriving quickly or the reverse at the flowering stage. It is not likely, however, they will flower in less than eight years. Meanwhile, grow the bulbs as well as possible. Keep them in growth so long as the leaves remain green, and keep them without water entirely when the foliage is ripened off. And not merely without water, but airy and dry withal above. In brief, these very definite periods are the best means of cultivating these plants known at the present time. The species is by no means free or certain in its flowering, however.

PHLOX DRUMMONDII.

Where a selection of twelve of the most desirable hardy annuals is requested, Phlox Drummondii should always be given a prominent place therein. Few, if any, annuals can furnish more brilliant displays of coloring than are to be supplied by the many offsprings of this plant. In common with most hardy annuals, their culture is simple; nevertheless, to obtain highly satisfactory results, give them some good rich material to grow in. Successive flowerings can be had by sowing the seed indoors and transplanting the young seedlings, giving thus early results, or by sowings in the open ground, when all danger from frosts is past, for later.

JOHN F. JOHNSTON.

GRASS FROM THE LAWN MOWER.

Often this is regarded as material of but little value; perhaps where the lawn is of small extent it may be so, but it must be a poor garden that could not find a use for lawn grass fresh from the week's mowing. A purpose for which we invariably employ a good deal of short grass is as a mulch to something it is deemed necessary to protect from the direct rays of the sun. Celery trenches afford an illustration for its use. When small plants of this are freshly put out, and the weather sets in bright and warm, the soil needs frequent watering to keep the surface moist, and, as celery plants are soon injured by drought, and there is not so much time for watering, a light covering of lawn grass saves labor, while it preserves a greater equality of moisture about the roots. We have known instances where celery, after being planted, has gone through the season without any help from watering save that given to settle the soil down in the first instance. We are not so fortunate as this, the nature of the soil demanding more effort. Celery when neglected in the matter of root moisture is much inclined to bolting. Some objection may be raised against the use of grsas because it is not lasting. True, the action of sun and air quickly reduces its bulk; but as the mowing has to be done often, so can additions be given to surfaces already treated. Tomatoes against hot, sunny walls are benefited by a surface mulching, for, if water cannot be applied often, the soil gets hot and very dry, and consequently plants languish instead of progress. Unless afforded sufficient moisture at the roots these set their fruits indifferently. During hot summer weather grass and clover seeds mature sufficiently to vegetate from one mowing day to another. This may be regarded as a nuisance, which, should wet weather ensue, may be the case; but in hot weather this growth is easily destroyed by mowing it on a sunny day. In the celery trench we have not found grass and clover seeds give rise to any such troubles. If no use can be put to grass in a green state it can be collected in a heap week by week, and when decayed employed either alone or in conjunction with manure for digging or trenching into the garden in winter. To this, again, objection may be raised, for, if used too freely, it has been found to render soil heavy or rather close in texture, but this only when employed alone. Unless other material can be jointly used, it is not advisable to dig rotten grass into heavy land.—W. S.

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BRUGMANSIA SUAVEOLENS.

The Brugmansia should be kept fairly dry throughout the winter in order to thoroughly ripen the wood. This will result in all the leaves falling, but you need not concern yourself about that. Then, in the latter part of August or early in September the plant should be pruned. In carrying this out cut away any old and exhausted wood, and cut back the vigorous shoots to within one or two eyes from their base, always, of course, bearing in mind that one object of pruning is to ensure as symmetrical a shaped plant as possible. With the return of spring more water may be given, and on bright days a syringing will be beneficial.

The flowers are white and extremely fragrant. From nearly the centre of the bulb the flower stem issues and attains 15 inches in length or so, and at this level are a number of flower buds arranged in an erect umbel. The individual blossoms are composed of a long tube. At the end of this tube the blossoms open out after the manner of a single tuberose, much longer and larger, however, and more elegant in form.

PRIMROSES.

Most charming of spring flowers are the Primroses, and it is questionable if any are more beautiful than the wild blossoms of our fields and woodlands. In moving some clumps a few months ago I took up a quantity of self-sown young plants, and these were planted out by themselves and have now attained a good size, and I purpose planting them under a hedgerow in the garden. Few grow the common field sorts, perhaps because they are common, but in spring they flower freely in the garden with finer blooms, and on banks and hedgerows have a pretty effect.—WOODBASTWICK.

COMMON MUSK IN OPEN BORDER.

During this season I have been much pleased with a large patch of musk growing in a shady border here in kitchen garden. Some two years ago this was thrown out with some soil from the potting bench. On the wall above wallflowers are growing; the seeds drop and sow themselves amongst the musk roots. During this summer the musk has found the wallflower stems a good support, and has climbed up a foot or more, spreading all over the wallflowers. For many weeks this was a sheet of yellow, several feet across, and nothing could be more lovely. The musk roots get no protection in winter or assistance in any way. Musk may be used as a carpet to many things with the best results.—J. C.

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The Orchard.

OPERATIONS FOR JUNE.

Although the best time for planting is past the majority of orchardists will still have to do this work. Presuming the ground to be in readiness and the trees to have arrived from the nursery, the holes should be opened as expeditiously as possible. These cannot be made too large, although 2 ft. deep and 4 ft. across is large enough as a rule. Before placing the tree in position sufficient soil should be placed in the hole to form a mound in the centre, rising to within 3 in. of the ground level. On this the plant is set with its roots pointing downwards, in which position they are kept until covered. The hole is then filled and the soil well trodden, leaving a hollow round the tree about 2 in. deep. The pruning of trees should be brought to a finish during the month. Very few fruit spurs should be left on young pear and apple trees for the first four seasons, and if through injudicious pruning any considerable number of such spurs have formed, most of them should be cut off close to the branch. There is no harm in allowing a fruit or two to develop, either out of curiosity or to test the variety, but to allow trees so young to bear full crops is a quick way of destroying them. Now that a certain preventive of the codlin moth pest has been found, it behoves all growers to adopt a uniform method of pruning to suit the reach of the spraying machines, and it is agreed that low trees, 7 to 8 ft. high, can be manipulated more effectively than taller ones. This method will also allow pruning operations to be carried out more expeditiously. It will be necessary to prevent any crowding of branches; each one should be quite clear of the other, with some 12 in. at least of space between all fruit-bearing parts, so the spray may be able to settle upon every individual flower. In the case of young trees that have not commenced bearing as much growth as possible should be allowed to develop, so long as the future main branches are not interfered with, and do not, as is usually done, prune a young tree as though it was an aged one in full bearing. There are thus two extremes to be avoided in pruning young trees—one is allowing them to bear at too young an age, and the other not to cut away any more wood than is absolutely necessary until they arrive at a bearing age.

PLANTING AN APPLE ORCHARD.

Selection of soil is one of the first considerations. Without a deep clay subsoil to hold fertility, apple-growing is not likely to be profitable. A sandy soil throughout should be rejected, a sandy surface soil with a clay subsoil is one of the best. A good, rich, deep loam, capable of producing 70 bushels corn, is about right (writes Dr. Mayer in the American Agriculturist). If not up to that standard of fertility be prepared to fertilise at once or don't plant. Apples can be grown on nearly all soils, but not profitably in a commercial way. Farmers should plant a few trees, no matter what kind of soil they have. The profitable orchard depends much on location. A summit should be avoided, but enough elevation and adjoining slope is desirable to have thorough air and water drainage always.

The soil should be thoroughly ploughed, or, if for only a few trees, spaded. In one instance we lost at least three years by not having the ground in condition at time of planting. Merely digging a hole large enough to receive the roots is not sufficient. A complete surface coat of loose, fine soil is necessary to secure a good growth. As to variety, locality will very largely determine the choice. Those known to succeed in a given locality will be safest, as a rule, though new and old varieties, a few of each, should be tried, and may be profitable, even though they themselves produce but little fruit. They may be good pollenisers; and we should remember the experiment stations do not have a variety of soils, and can't do everything. Varieties known to produce fruit of very poor quality should never be planted, no matter how showy or productive. Such varieties do more to demoralise the market than all other causes combined. There are many varieties, both productive and good.

In selecting trees for planting, I would reject a tree with roots all to one side, no matter how symmetrical the top. Such a tree, no doubt, would grow as well for a few years as any other, but the chances are that the root growth would continue mainly on one side, and before the tree would become large enough to bear a good crop some storm would lay it low. We have an orchard planted 23 years ago, in which a number of such trees failed after six or more years, and now the orchard has an uneven appearance, to say nothing about the loss of many crops of fruit. All mutilated roots should be cut off smooth, no more than necessary to secure a cut in the sound parts, as that favors the formation of new roots. The crushed or mangled part is likely after some time to die, and Nature's efforts and time may be lost before she determines which shall grow or decay. As to the top, I care very little, if the roots are all right and evenly distributed around the tree. We cut back severely, and the most objectionable part of a fork should always be cut away. If the roots are right the top will be easily formed. We firm the soil over and about the roots with the foot and full weight of a heavy man, finishing with 2 or 3 in. of fine soil, as nearly as possible on a level with the general surface. Thorough cultivation should follow the planting for many years. Never grow winter grains as an orchard crop. The plough should not cut the roots of the young trees. Not a speck of bark should at any time be injured or removed; therefore, chains, whiffletrees, ploughs, and harrows must not be allowed to strike the trees. Loose cattle, rabbits, and mice are objectionable in an orchard.

Prepared fertilisers or manure of some kind should be used in sufficient quantity to produce an annual growth of from 6 to 18 in. If the growth is above this standard the trees will make soft wood, be unproductive, and short lived. If the growth is much less the trees will be too long in forming heads and too weak to bear full crops of fine fruit. We fertilise individual trees according to their growth. A tree that makes too much or too little growth is much more likely to suffer from insect enemies than one of normal growth.

ENEMIES OF THE APPLE TREE.

By Monsieur Charles Baltet, of Troyes.

The apple tree is one of our most popular of all fruit trees. In France one meets with it nearly everywhere—in gardens, in the open orchard, on uncultivated land, or by the roadside, from the plains of Flanders to the mountains of Auvergne, on the hillsides of Vigan and under the shadow of the Alpine heights, or within the influence of the sea breezes of Normandy or Brittany, to say nothing of the highly cultivated and lucrative espaliers in the neighborhood of Paris.

And to what an extent its fruit is sought for, either for direct consumption or for industrial uses! Carts, wagons, and ships convey it to the markets, to the cider press, to the manufactory, to the stove of the fruit-drier, to the ovens of the confectioner, to the pan of the jam-maker. In all forms the apple is wholesome; and its culture and sale form the object of a very considerable and paying enterprise.

However, the watchfulness of the cultivator must be kept constantly on the alert if he means to safeguard his property from the attacks of its numerous enemies, and to fight against the unfavorable influences which frequently beset the conditions under which it has to grow.

The diseases of the apple are, in fact, often the result of badly made plantations, of unsuitable positions, or of neglected cultivation; above all, one ought to find out what is defective in the nature of the soil and supply the want. For example, endeavor first to provide coolness for the roots of trees that wither in a dry soil; and, secondly, to drain away excess of moisture from soils and subsoils which are always wet. These are conditions which weaken the growth and, in consequence, the bearing of the trees. The leaf, losing its strength, gets spotted, or bleaches, withers away, and falls prematurely.

Yellow Leaf.—In the first place, remove the earth round the trunk down to the roots, and to a sufficiently wide radius, replacing it by a mixture of fresh materials, sandy loam, peat, river dredgings, rotted turf, and waste animal or vegetable matter, the whole being watered with manure water or dirty water from the house. When the hole is filled up, cover it with a layer of rough grass, farmyard litter, or marsh cuttings, which will permit the rain to filter slowly through, being enriched at the same time by passing through them.

Scorching.—The blackening and drying up of the young shoots and leaves, caused by excess of moisture in the soil, necessitates the removal or draining away of the water by means of drains made of pipes of alder wood or burnt clay, trenches filled with broken stones or green fagots, the ground round the tree at the same time being repeatedly dug. If the tree is still young it should be dug up, and replanted sufficiently high, or even on a mound, then staked, and moderately pruned. Good may be done also by incorporating with the soil any light sandy substance, such as roadscrapings, cinders, and even clinkers.

Canker.—Canker arises from many causes—too much shade, cold, position, pruning the branches too short, without reckoning the invisible bacilli, fungus spores, split bark, &c. As soon as ever it is noticed the whole of the wound, with all the canker already formed and in the process of formation, should be cut out with a sharp knife and the healthy parts left bare, covered with some greasy substance. Stockholm tar, grafting wax, and such like are also effectual, so also is hydrochloric acid. Leave the branches unpruned, and enrich the soil close to the fine roots by introducing phosphates and powdered sulphate of iron. Paint the stem and larger branches with a mixture of clay, cowdung, and glue or milk, which will protect the bark against the action of cold, and also ward off the direct rays of the sun, both of which are causes of canker.

Frost Glaze.—Floods or heavy falls of rain followed by frost, causing ice and frost glaze on the stems of the trees, are liable to cause cracks in the bark at the time of thawing.

Exposed plantations will require the stems of the trees to be surrounded, to the height of from one-half to one metre, with straw bands or wisps of hay, which will at the same time preserve them from the attacks of hares or rabbits. These pests should also be kept at a distance by surrounding the trunk with galvanised iron netting. Traps or poisoned baits are used for the destruction of harmful animals, such as rabbits, moles, rats, fieldmice, dormice, &c.

Mosses and Lichens.—To remove old bark, mosses, and lichens, which, on the stems and branches, prevent the respiratory functions of the tree or serve as a harbor for insects, a scraper, a metallic brush, or a glove made of steel links may be used, and that most effectively immediately after a heavy rain.

Afterwards paint the trunks with a solution of sulphate of copper or of iron. Burn all infected waste. This cleaning of the wood is a health-preserving operation at all times, and should be done at each age of the tree, even from the very beginning of the plantation. This system of scraping —followed by a wash of nicotine or lime, either by itself or with the addition of sulphate of iron—is also adopted against the little Chermes aspidiotus, a kind of scale which fixes itself to the bark of apple trees grown too much in the shade or as espaliers.

American Blight.—Fight without ceasing against this terrible foe to our orchards, which, by its rapid spread, would otherwise soon end by destroying them utterly. Apple trees with widespread branches are most subject to it, because this style of growth allows the pest to grow on the underside of the branches. In the case of quite young trees, in the nursery or orchard, scrub the parts affected with a solution of ammonia, alcohol, urine, manure water, potash water, refuse oil, or a mixture of soft soap and infusion of nicotine. A hard brush which will penetrate into the roughness and cracks where the insects harbor must be used. Repeat the operation a week or fortnight afterwards, and whenever the pest reappears. Do not forget that it is wise to cut off and burn any young branches that are badly attacked.

Large apple trees should be submitted to a liming at the roots. As soon as the leaves have fallen, remove the earth around the bole and surface roots and replace it with lime or soot. The colonies of the aphis attack the young shoots while they pest will then not be able to hibernate.

Green or Black Aphis.—Several kinds of are still in a soft state, and hinder the flow of the sap. To remove these, either crush them with the hand, or sprinkle them with nicotine or pyrethrum powder, or syringe them with a solution of soft soap, and then wash them with ordinary water. Young nursery trees being particularly liable to these attacks, it is well to thoroughly syringe and moisten with water any buds or leafed branches that may be either strongly or even only moderately attacked, and to repeat it if necessary.

Hyponomeuta Padellus (the Small Ermine Moth).—To destroy this insect, which appears to be becoming commoner every year, the web containing a brood of caterpillars, which is not unlike a mass of cobwebs, should be either crushed or burnt. Bombyx dispar (the Gipsy Moth) may be destroyed by scraping off and burning the patches of eggs which resemble small patches of amadou. They are laid on the shoots and branches in places where they will be sheltered from the rain. Any shoots which show by their leaves curling up and withering that they are attacked by the caterpillars of Bombyx chrysorrhea (the Brown-tailed Moth) should be cut off, placed in a basket and burnt, and shoots encircled by the rows of eggs laid by Bombyx neustria (the Lackey Moth) should be treated in the same manner.

Cockchafers and their Larvæ.—The vigorous killing of cockchafers in all places is the first stage of the struggle.

The preliminary cultivation of the soil of the nursery or orchard, carefully carried out with a fork, will assist in the destruction of the larvæ in their underground haunts. Strawberry plants or salad plants planted here and there in the infested field attract the grubs. As soon as a plant fades, dig it up with a spade, which will remove it from the soil, with the enemy still at its roots. This method is often necessary where the pips of apples or pears have been sown in the nursery.

The young seed-beds are equally subject to the attacks of the Courtiliere or "Mole-Cricket." Follow its burrow with a finger; when you have traced the direction of its nest, give it, through a funnel, a few drops of oil mixed with a pint of water. The insect will come out of its hiding-place and die in the open air.

Various weevils belonging to the following genera—Anthonomus, Apion, Rhynchites, &c.—form a group of small beetles which are very difficult to capture.

Here, again, the careful dressing of the tree will help much to destroy them. The different transformations undergone by these insects being hindered, they will not be able to stand against the war waged against them in the hiding places where they take refuge. Remove the dead bark from the tree, sulphur the stems and branches, cleanse not only the infested apple tree itself, but its surrounding neighbors, no matter what dressing you make use of. Then remove a layer of earth and turf from round the bole of the tree, and make an "auto-da-fé" of it and the debris you have collected. The "Lisette," belonging to the genus Phyllobius, which destroys the buds in the spring, should be collected early in the morning, or during rain or watering, and crushed.

The Agrilus, a beetle which has no English name, and the caterpillars of the Goat Moth (Cossus ligniperda), should be sought for at the end of their burrows. Any greasy matter spread and renewed on the trunk will prevent the female insects from depositing their eggs on the bark or in the sapwood, and will stick to and hold any of the winter moths (Cheimatobia brumata), either male or female, that crawl over it.

Luminous traps, well managed, are capable of causing great havoc among winged insects, hardly to be noticed from their minute size and night-flying habits. Moths belonging to the family Pyralidæ and flies belonging to the genus Cecidomyia, which attack apples , are among the number. Alas, that all fruits cannot be tied up in bags!

As regards the day-moving insects, our charming assistants, the small birds, take upon themselves to free us from them, or at least to make great havoc among them, and to capture them both in the egg state and during their various changes.—Journal of the Royal Horticultural Society, London.

Vegetable Garden.

OPERATIONS FOR JUNE.

By W. S. Campbell.

There has been splendid rain, with good prospects of a sufficiency for the growth of seasonable vegetables.

Broad beans and peas will be the most prominent of the legumes in cultivation, although in the sheltered, warm localities about the north coast, French or kindney beans may be grown successfully throughout the year. Tomatoes also, to some extent, may be grown, as well as potatoes and other tender vegetables, but it is almost useless to sow seeds of these wherever frosts occur. Tomato plants may be kept alive—young rooted cuttings—in many localities with cool temperatures, under some kind of protection, for the purpose of planting out as soon in the spring as is advisable. Such rooted cuttings will grow quickly as the season advances and bear fruit sooner than seedlings raised in the spring. Plants of young capsicums can also be kept alive, under protection, for early fruiting next season. By a little management, in this way, the season for such kinds of plants may be extended to some extent. But wherever natural shelter has been destroyed, or where artificial shelter has not been provided for the garden, the difficulty of keeping tender plants alive will be increased.

Asparagus and Rhubarb.—As the same kind of work is necessary for these two permanent vegetables, they may be referred to in the same paragraph. Both of them may be planted towards the end of winter or early in the spring before they begin to shoot, but in order to grow them to the best advantage it is advisable to have the land prepared for them some time in advance of planting. Have the land well dug, or better still trenched, keeping the top soil on the surface, and, unless it is naturally in good heart, dig in and mix well with the soil a heavy dressing of good dung, the more the dung has been saturated with urine the better it will be. The undigested chaff which is not infrequently used for manure is of value only as vegetable matter. However, if some sulphate of ammonia or nitrate of soda, with superphosphate of lime and potash, be mixed up with this stuff, it will, when rotted, make a useful general manure for vegetables. To save the trouble of mixing the different ingredients mentioned, a "general fertiliser" can be obtained. I may say that I have found nitrate of soda applied to established plants of asparagus in the spring, either as a top dressing or dissolved in water, to be very useful indeed .

Broad Beans.—Seeds may be sown as extensively as may be required. One of the most useful varieties is the Windsor broad bean. There are many varieties, some with huge pods, but the above is a reliable good bean although an old one.

Beans (French and Kidney).—Sow only in warm localities where early frosts are not likely to occur.

Beets (Red and Silver).—Attend to growing plants. Keep down the weeds and thin out well in order to allow each plant to make proper growth. Do not sow any more seed during this month.

Borecole or Kale.—Sow a little seed if it be thought that more plants will be required. Cultivate the soil frequently between the rows of all kale which have been planted out.

Brussels Sprouts.—This most useful vegetable succeeds best in a cool climate, and should be grown wherever it is likely to be successful, for it is one of the best of the cabbage family; A little seed may be sown to keep up a stock of seedlings. Any plants that are sufficiently advanced may be planted.

Cabbage.—A little seed may be sown to keep up a succession. Advanced pricked out seedlings can be planted out from time to time to meet requirements.

Cauliflower.—Sow a little seed and plant out advanced pricked out seedlings.

Carrot.—This is a good time for the sowing of carrot seed. Sow it thinly in drills in well-worked soil. Thin out the seedlings by degrees until the remaining plants stand well apart. Keep down all weeds by frequent cultivation between the rows and hand-picking amongst the young plants.

Celery and Celeriac.—Plant out strong plants from seed-bed. Earth up advanced plants.

Endive.—Sow a little seed and plant out strong seedlings that may have been raised.

Leek.—Seed may be sown in good quantity, in, say, two or three sowings during the month. It may be sown in a seed-bed, and the young onions transplanted when large enough to the permanent bed. Dig the soil well, drain well, and manure well, that is if the soil is not rich enough to grow onions without manure. Make the soil on surface of bed quite fine if the seed is to be sown where the onions are to grow. Sow the seed thick and broadcast if you desire to raise small onions, say for pickling, &c. If large ones are required, sow thinly in drills, and when the young onions come up and have grown to a few inches in height, thin them out well. Should there be any vacant spaces in the rows, some of the thinned-out onions can be planted in the gaps.

Lettuce.—Sow seed and transplant seedlings.

Parsley.—This necessary herb should be in every garden. A little seed may be sown if plants are required.

Parsnip.—Sow a little seed in drills. The ground should be dug deep for this vegetable if good roots are required.

Peas.—May be sown from time to time as required.

Radish.—Sow a little seed occasionally in well-prepared small beds. Use well-rotted dung, and endeavor to grow the plants as quickly as possible, and use them whilst they are young and tender.

Mustard and Cress.—Sow a little seed occasionally.

Seakale.—This is a vegetable but seldom grown, probably because it takes a little more trouble to manage than other vegetables. Its botanical name is Crambe maritima. It must not be confounded with borecole or kale, which belongs to quite another family. The seakale succeeds best in heavy soil, thoroughly well manured, and dug or trenched 2 ft. deep. At the present time of year the seakale plants are, or should be, ready for planting—that is, when they are bare of leaves. Plant so that the tops of the kales are just about

2 in. below the surface when they are covered up. The plants start growing in the spring, and they should be encouraged to grow as much as possible by applications of good liquid manure throughout the growing season. In the autumn the leaves will die away, and the plants will remain dormant during the winter. Early in spring, before the shoots start from the crowns of the plants, large "kale pots," or large flower pots, one for each plant, should be placed over the plants, and over the pots dead leaves or something of that kind should be heaped. This becomes a sort of hotbed, and the leaves begin to grow, and if the light is kept quite away from them, they are quite white, and as tender as possible. When large enough, the blanched leaves can be removed for use, leaving a few around the crowns for use of the plants after the pots are removed. When well grown and quite blanched, the leaves, when cooked, make a most delicious vegetable. Should the crowns of the plants, after they start into growth when the pots are removed, develop a good many shoots or buds, remove all but one, and let this grow. Next season treat the plants in the same manner as before. All this seems a deal of bother, and it is not easy to describe in writing; but in point of fact, the work is as simple as possible, and may be managed very well by any one who likes to make a trial.

Spinach.—A little seed may be sown of this good vegetable, which is well worth the growing.

Shallots.—Plant out a few cloves in well-prepared soil, with fine surface. Just press the cloves down into the soil.

Herbs.—Sow some seed, in order to raise some of these useful plants, which are indispensable for the kitchen.

—Agricultural Gazette of N.S.W.

One division of a well-laid-out vegetable garden is devoted to perennial roots. These comprise five kinds—asparagus, seakale, globe artichokes, rhubarb, and horse-radish. The three first succeed well on the plains, and all require the same general treatment. To prepare the ground a rather large quantity of decayed stable manure should be spread, and the whole trenched to a depth of 2 ft. For globe artichokes and seakale the holes are made 9 in. deep, and the roots put in with their crowns level with the surface of the ground. The roots should be 2 ft. apart from centre to centre of the crowns, with the same distance between the rows. After planting the rows should be mulched, or, what is better, the whole surface of the beds should be given a coat of half-decayed stable dung. Asparagus ground may be prepared in the same way, and when the plants are ready to put in, trenches 9 in. wide are opened the length of the beds. In these the roots are laid flat, about a foot apart from crown to crown. The rows should be 2 ft. apart, measuring from the centre of the rows. After planting, a good sprinkling of salt should be thrown over the bed, and then a heavy coat of well-decayed stable manure laid over the surface. A bed measuring 2 rods will amply supply a large family during the asparagus season. Established beds of asparagus should during the month be cleared of stalks and weeds, dressed with short decayed stable manure, well forked over, and coated with either wood or coal ashes. The ashes prevent the soil from adhering to the sticks when they are being cut for use, and also render it much easier to hoe and weed the beds in the spring. Established beds of seakale should be manured and forked over at once, and pots or boxes placed over the crowns ready for forcing. To have a supply of this vegetable over a long period a start to force it should be made at once, dividing the bed, if large enough, into six parts, one part to be covered every fortnight. As soon as each part is cut the manure and pots should be removed to expose the crowns and allow them to regain their strength. As soon as the boxes or pots are placed on the crowns they must be covered with long stable litter to exclude light and to supply, by fermentation, just sufficient heat to cause a rapid growth. Rhubarb may be forced in the same manner, and is then considered to be much superior in flavor to any that grows in a natural way.

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The Flower Garden

OPERATIONS FOR JULY.

By J. Cronin.

Where land has been prepared for the reception of deciduous trees and shrubs the work of planting should be performed as speedily as possible if the weather conditions are suitable. It is better to plant as soon as the leaves have fallen, and before the ground becomes cold and saturated with winter rains, as the roots soon begin to grow if the soil is fairly warm, and the "puddling" attendant on planting in wet soil is avoided. The soil should in all cases be firmly trodden, to ensure an even distribution of water; if this is not done the moisture is likely to soak around and underneath the plant, without moistening the "ball" of earth surrounding the roots. It is not at all unusual to see a plant suffering from want of water, while the soil around it is almost saturated. When removing deciduous plants or trees, care should be taken to avoid damaging the roots, although it is not necessary to retain a "ball" of soil with such plants. In the case of large specimens, a trench should be dug at some distance from the stem of the tree, sufficiently so to avoid cutting any of the principal roots, and deeply enough to enable the operator to "mine" underneath the main roots. The soil may then be "combed" away with a fork or pick until sufficient has been removed to enable the plant to be shifted to its new quarters, where it should be planted at about the same depth as hitherto, the roots carefully arranged at the depth and position they originally occupied, the soil firmly packed around and over the roots, making again as near as possible the original "ball" before the combing. Any roots damaged should be cut back to a sound, undamaged part.

In the case of evergreen shrubs or trees, a deal of the soil may be removed in the same way; but not nearly as much as in deciduous trees when dormant, when the whole of the soil may be shaken off without much risk. The roots should not be unduly exposed to drying influences, and a thorough watering should be applied when the planting is finished. In the case of Cordyline Australis and other plants, a fleshy tap root will be found below the lateral system of roots. This must not be broken or injured, or the plant will surely die.

Drainage is generally necessary, and more especially where large plants have been removed, as fairly deep holes must be provided for their reception, and if the drainage is not thorough and of a depth sufficient to drain the hole made, the soil is sure to become sour and cause the death of the plant.

The Chinese magnolias are handsome deciduous flowering plants, very effective in spring. One of the features of the Melbourne Botanical Gardens is a group of these plants, and each year in September the gardens are specially visited by hundreds of people, particularly to see the magnolias, which are well worthy of a visit. Of those procurable in our nurseries, M. conspicua, Lennei, purpurea, obovata, superba, and stellata are the best. Stellata is a beautiful dwarf-growing white-flowered species, worthy of a place in any garden. The tulip-tree, Liriodendron tulipiferum, is another of the same order worthy of cultivation in large gardens.

Large-growing trees should never be planted in small gardens, i.e., of less than an acre in extent. One frequently sees fine specimens of Pinus insignis and other pines, Moreton Bay fig, Norfolk Island pine, and other trees, including the ubiquitous pepper tree (Schinus) in gardens not a tenth of an acre in extent. The result is, of course, that nothing else which will satisfy any gardening taste will grow in the place, and eventually all effort to grow plants is abandoned. These large trees are in many places necessary as breakwinds, but should be well away from the flower garden. Coniferous trees that are suitable for gardens of moderate size are: Retinospora plumosa, Cupressus Lawsoniana aurea, Abies alba, and nigra, Picea Fraserii, and the handsome dwarf, or, rather, slow-growing, parasol fir, Sciadopitys verticillata. The Japanese Persimmon is a deciduous shrub or small tree, that should be more extensively planted in garden borders. There are a number of varieties varying somewhat in habit, and in size and shape of fruit. In most districts they color beautifully before losing their foliage in autumn, after which the golden colored fruits are very showy. They are becoming better known as a delicious fruit when properly ripe.

Summer-flowering, herbaceous plants may be divided and replanted. The improved Shasta daisies are very fine, and, being dwarf, are suitable for narrow borders.

Sweet peas are among the most showy and useful of annuals. They require a deep well-manured soil to give best results, and should be sown early that the plants may be strong and vigorous before commencing to bloom. To have them in flower for a long period, seed may be sown several times, from June till August. They should be trained on a trellis or wire support. The "cupid" sweet peas are a dwarf-growing type, and are suitable for borders or small beds.

Chrysanthemums should be divided and the divisions planted out in unmanured soil to grow till spring. Where large flowers are desired the ground should be prepared now by digging in a liberal coat of good manure. The beds should be allowed to remain rough and high, to thoroughly sweeten the soil during the winter months, and later should be again well turned, and the soil and manure mixed together.—"Agricultural Journal of Victoria."

FLOWERS.

Except in very cold places deciduous ornamental plants may be planted about the garden. This is a good time for a general overhaul useless plants should be taken out to be replaced by something better. Gardens are sometimes quite spoiled with half-dead plants or by overgrown trees and shrubs. Clean away all rubbish apply a good dressing of rotted farmyard manure, dig it in well and make ready for planting, either during the month or at any time until change of season.

The most generally preferred flower, and in most people's estimation the best, is the Rose, the universal favorite. Everyone with a garden should endeavor to make a good collection, and after planting look after the plants. Roses may be planted during the month or later still, but it would be as well to get the work of planting finished without delay. One of the prettiest of roses, pretty in all its forms from bud to the falling away of the petals, is Kaiserin Augusta Victoria, which is well worth growing. There is a climbing variety which may be even better to grow in some gardens. The flowers are the same as the other. Madame Caroline Testout is a beautiful rose also well worth having. This bears large globular pink flowers. Mildred Grant, Madame Abel Chatenay, Climbing Niphetos, Papa Gontier, Madame Jules Grolez, The Bride, Maman Cochet, Marechal Niel, The Meteor, Madame Hippolyte Jamain, Catherine Mermet, Bent Cant, Frau Karl Druschki (one of the most beautiful white roses in existence), Ernest Metz, Clara Watson, and Liberty, are all worth having; but there are hundreds of other good ones to select from. I have fust planted out for trial (but my soil is of the most wretched description) many of the long-named new varieties which are said to be excellent. Some of these are: Oberhofgartner Terks, Frau Lila Rautenstrauch, Gustave Gunnerwald, Grosserhzog von Oldenburg, &c. If the flowers turn out to be as marvellous as the names, I will make a record of them for general information.

THE ROSE BORDER.

By C.

The season has now come when we must see about renovating our beds and flower borders, removing those plants and shrubs which we no longer desire, and planting fresh ones in their places. The first claim on our attention is the "queen of flowers," the rose. Of all floral embellishments of the garden the rose reigns supreme in all parts of the civilised world. So universal is it, that it may be found growing in one form or another in nearly every garden whether belonging to palace or cottage. Rose-growing to be successful must be taken up in earnest, no half-hearted rose-grower ever arrived at excellence; but often blame his failures to the soil, situation, or nurseryman, when all the time it is his own fault. The real lover of roses will discover a charm that will increase as time goes on, "and every successive season will present new beauties and supply additional delights as their sweet fragrance perfumes the air."

Roses that have not done well should be replaced by others more suitable. They are better when grown by themselves in specially prepared beds, but this is not always possible, so we have to make the best of the situation. They like abundance of light and air, yet need to be sheltered from strong boisterous cold wind. Though roses will grow in almost any soil, the most suitable is a deep rich and rather heavy loam. Sandy soils may be made suitable by adding clayey soil to it, and stiff heavy soils rendered open by adding such material as wood ashes, soot, leaf-soil, and thoroughly decayed stable manure. Tea and Noisette roses do better on light soil made up by adding heavy soils. Good drainage is necessary. Experience has proved that it is better to put most of the manure on as periodical mulching and dig it in afterwards, than put it in the bottom of the trench. Before planting, all bruised root should be removed by means of a sharp knife. If it is necessary to plant them near trees or big shrubs the roots of these should be cut some distance away. The chief item of work among roses at this season of the year is pruning. Much difference of opinion exists among the experts as to the time and manner in which different varieties of roses should be pruned. The sorts, situation, and climate have a lot to do with it. The old method of pruning everything hard back needs to be modified owing to the large number of varieties of roses now grown. For instance, we have a class called hybrid perpetual, produced by crossing and recrossing of Damask provence and French roses with others; these flower mostly in spring. They are not comparable in profusion and continuous blooming to the hybrid teas, but in their flowering season are well able to hold their own. The tea scented or monthly roses have sprung from rosa indica as the result of various crossings; Noisettes from indica and moschata. Teas and Noisettes crossed with H.P. have produced hybrid teas; these are now universally planted because of their beauty and usefulness, having proved themselves the most serviceable of all, though they lack the rich colors and good form and fragrance of the hybrid perpetual class. The mode and extent of pruning depends largely on the class to which the rose belongs and the climate. Varieties producing growth from one to twelve feet in length cannot all be pruned the same. Varieties of the H.P. class of robust growth with large buds do not need such severe cutting, or they will make wood at the expense of the flower; but if only decorative flowers are wanted, the canes may be tied down to stakes, when they will produce an extra quantity of blooms. The canes may be cut away after flowering, sorts with short twiggy shoots and small buds may be cut harder. It must be remembered that blooms come only from new, well-ripened wood of the previous year's growth, all old and exhausted wood should be cut out as well as soft unripened shoots. Bourbons, such as Sou. de la Malmaison, should be cut as soon as they have done flowering.

Teas may be treated the same way as bourbons, having only their thin branches tipped. Hybrid teas as a rule do not require close pruning, but those of the Lady Mary Fitzwilliam kind may be pruned back harder. No overcrowding of shoots should be allowed, and all weakly growth removed, as weak shoots only produce weaker ones. Even cold districts need not be without their roses, for many sorts will be found to do well, such as W. A. Richardson, Reine Marie, Henriette, and others, especially H.P.

In frosty districts Hybrid perpetuals and Bourbons may be pruned early, while teas and Noisette, China, Banksia, and others of more tender constitution should be left till all likelihood of frost is over. To bend down the wood checks the growth, to turn upright strengthens it, to remove some leaves lessens the vigor. Two roses pruned at different times will not flower at the same time. It is possible to retard or advance the flowering of roses by means of pruning or pinching at certain times of the year. A succession of blooms may be had early by bending down the wood fairly early by pruning long, late when cut short.—"The Australian Agriculturist."

GROWING FREESIA.

About the care of the bulbs after the flowers are cut, I save all my own bulbs. The stock I have has been grown by me for twenty-two years. In all that time I have never purchased any fresh stock, for the good reason that there is not any to compare in quality to mine, which every one can testify to who has seen my flowers; exploding the theory that it doesn't pay to save your own bulbs. After the bulbs are done blooming the foliage is cut off, about 2 in. above the earth, and the bulbs are ripened off by gradually withholding the water if the bench room isn't needed. But if the room is needed, I lift the bulbs out with as much earth as possible, using a trowel, and put them under the bench to ripen off, which answers just as well as leaving them on the bench, only it is a little more trouble. Then on wet days they are picked out of the soil and put in flats, or boxes, until all are done. They are then sifted through sieves of different size mesh to sort the bulbs into sizes. I save all my bulbs, both large and small. The large ones are sold and the small ones I plant. Those of the large ones left unsold are also planted. The small ones I plant in rows, 2 in. apart, and 1 in. between the bulbs in the rows. These bulbs are about the size of dried wax beans, and as small as peas. From these I cut fine flowers. The only difference is that they are shorter in the stem than those produced from large bulbs. I wouldn't think of planting bulbs so small of the ordinary freesia, nor would I advise any one else to do so.—R. Fischer, Great Neck, L.I.

HALF-HARDY CLIMBERS.

There is always room to be found among the hardy permanent wall plants for a few of the above class, and some of them are content with so comparatively little space as to cause no inconvenience whatever to them. In fact, a few of the slender annuals, as Mina lobata and Mina coccinea, would do planted at the foot of a spring-flowering plant, such as Cydonia japonica, and allowed to ramble over it at will, thus forming an embellishment after its own blossoms have perished. Mina coccinea is of less rampant growth than M. lobata, and would suit the purpose admirably. True, its flowers are of short duration, but they succeed one another so quickly that there is always a fair sprinkling seen on the plant.

A plant of sterling worth for a trellis is Manettia luteo-rubra (bicolor). It hails from Brazil, and is often classed as a hothouse climber, but if cuttings are rooted in the fall, and taken care of during winter, then, when all danger of frost is over, are planted out, they will do better than when grown under glass, where thrips and red spider attack it freely. The flowers, which are urn-shaped, are of a vivid scarlet and yellow, a very conspicuous combination of color. They are borne freely in the axils of the leaves.

Another Brazilian plant more often seen as a roof or pillar climber in a warm conservatory than in the open air as a summer trellis plant, is Stigmaphyllon ciliatum. Its blossoms are borne in panicles of clear yellow flowers, slightly fimbriated; and so strongly does it bear resemblance to the flowers of Oncidium varicosum as to merit the name of "orchid vine." The writer, when visiting the nursery of Henry A. Dreer, Riverton, N.J., last summer, was agreeably surprised to see this most interesting plant outside, and flowering nicely.

Two meritorious plants of Australian origin are Sollya heterophylla and Hibbertia dentata; the former often called the blue-bell creeper, on account of its drooping blue flowers. The latter has foliage of a deep bronze color, with large potentilla-like flowers of bright yellow. Both are evergreen, and well worthy of a trial. A little peat or leaf soil should be added to the soil when planting.

A slender but quick-growing trellis plant is Rhodochiton volubile, from Mexico. It bears very singular flowers in great numbers. The calyx is of a blood-red color, while the corolla is nearly black. This plant is easily raised from seed every year, and requires much the same treatment as its near relative, Maudandy scandens.

One cannot omit to mention two at least of the Tropæolums, for who that has seen that lovely Chilian plant, T. speciosum, in bloom, will soon forget it? The brilliant scarlet flowers show up most effectively against its green foliage. It is not particular with regard to aspect, providing it is planted in a cool, moist soil. Tropæolum canariense will prove itself a worthy companion for the last-named, with its many pretty little yellow flowers.

Perhaps it is needless to say that all the foregoing plants should be pot grown, so that they may receive no check when planted out at the earliest opportunity.—Edwin Matthews, in the "Florists' Exchange."

PRIMULAS.

Points of importance in the culture of all primulas are a good drainage in seed pans and pots, an abundance of pure air, and timely ventilation and the use of a sweet, sandy, very porous, non-baking soil. Good primulas cannot be grown in a loam that has a tendency to bake, to form a solid mass every time it becomes a little dry. A good sandy compost, partly decomposed sod and some gritty leaf mould in equal parts make a good mixture for primulas, nice for the seeds and fit for the plants in pots. The seeds should be covered but lightly, preferably with finely sifted moss. As soon as the plantlets can be handled, when two or three true leaves have been made, a transplanting into trays becomes necessary. In the case of young primulas, a potting up of the plants at this stage does not offer the advantages that a pricking off would. Even another transplanting after this, as soon as the plants appear crowded, into boxes, instead of pots, will render their treatment easier and will give greater assurance of entire success. Then when they have reached a size requiring a 3-in. pot, it is time enough to begin pot culture. In potting primulas, especially the Chinese, some extra care should be exercised to set the plants deep enough to keep them from listing to one side or falling over when sprinkled. The very flexible neck of the plant, unable to carry the heavy crown in an erect position, should be under ground, but only deep enough to secure firmness, and not too deep, which would cause the crown to decay. During the summer primulas fare best in a frame out of doors, where, in the matter of watering, shading, and ventilation, they are least liable to suffer from extremes in these essentials. In the fall they should be kept there and out of the greenhouse as long as ever the weather allows, a cold frame with close-fitting sashes being at that time a much better place for them than a steam-heated greenhouse.

PROPAGATING DAPHNE CNEORUM.

The hardiness of the Daphne cneorum, together with its half-prostrate growth and lovely, sweet-scented, rose-colored flowers, or rose in the bud and pink when expanded, have made it a plant much used for the bordering of beds of larger growing shrubs, such as rhododendrons, azaleas, and kalmais. The flowers come in early spring, and for sweet odor can hardly be excelled. This daphne delights in a light, sandy soil. In fact, it may be all sand for planting in, if a good mulching of manure be placed over the face of the sand. In this sand the plants will root freely, and if they be set deep enough, roots will be made by the buried branches, and in this way propagation is easy. Another method of propagation is by grafting, using the D. mezereum as a stock. The plants unite well and D. cneorum grows well on it. The grafting is often done in winter indoors, but may be done at other time, as convenient. Still another way is by cuttings, rooted in a greenhouse, using half-ripened wood for the purpose. As a pot plant, kept in a cold frame all winter and brought to heat early in spring.

PROPAGATING MAGNOLIAS.

In the line of magnolias there is no better way than layering. Budding, grafting, and other methods are employed to some extent, but the old way of layering is the most solid of all. This is the time to cut back almost to the ground the stocks desired for layering purposes. Take some real heavy plants and cut them back to but a few eyes above the ground. This will cause the growth of strong young shoots, which are just the sort needed for layering. The work should be done as soon as the shoots are of length enough to permit of it. If put down early they will be nicely rooted by fall, but should not be cut off from the parent plants before spring. Old hands at propagating aver that but little is lost by allowing the layers to remain undisturbed for two years. In this way, too, the old plants are permitted to have a year's rest from layering, strengthening them, as the cutting down and layering the same plants year after year weakens them. This will lead propagators to have two sets of plants for layering, working one set one year, the other the next, which is much the better plan.

When propagating keep in mind the desirability of Magnolia Lennei. All the early flowering sorts, led by M. Soulangeana, are good sellers, but a more than good one is M. Lennei, and for these reasons: It is one which bears very large, cup-shaped, purplish-red flowers, differing from all others in the color and form of flower, when it flowers fully ten days later than the other early flowering ones, bringing up the end of the season, and always escaping the late frosts, which so often catch the very early sorts. I do not remember that M. Lennei was ever caught by frost, though the earlier ones often are.

TRUMPET VINES AS SHRUBS.

As a vine the trumpet vine is well known, and when in the height of its flowering, in late summer, a well-developed specimen of it is a glorious sight. For the covering of old trees, rough walls, and like objects, it is most useful. For the walls of dwellings it is not so well fitted, being of a too sturdy nature to harmonise well with surroundings.

The use of this vine to form a shrub is not often made; at least, not as often as it should be. When seen in such a shape it is interesting and beautiful. The large trumpet-shaped flowers are in display for many weeks. The flowers are in clusters, and one of a bunch succeeds another; and as every vigorous shoot will have a bunch of flowers at its end, the display is very fine.

The commonest trumpet vine is Bignonia radicans. This is our wild one, native of the Middle States, and the one usually seen in collections. But there are varieties of it, some with flowers darker red than the type; and, recently, an entirely different one—a yellow-flowered variety—has appeared in cultivation.

One of the showiest of all these bignonias is the Chinese species, B. grandiflora. This has flowers more yellow than our native one, B. radicans; the flower tube is shorter, while the mouth of the flower expands more than the other. It seems to have found its way to Germantown very many years ago, judging by the very large vines of it to be seen here and there on walls.

The Southern one, B. capreolata, is of an evergreen character and does not bear close resemblance to the others. It is, in fact, classed separately by botanists. They make it a true bignonia; the others, our trumpet vines, are called tecoma. B. capreolata lives out in Germantown. Some years ago "Gardening" had an illustration of one in full flower, covering to the eaves the wall of a house there. The color of the flowers is a light orange.

The way to make shrubs of bignonias is to stake a vine, using a stout stake and seeing that it is maintained for some years, until the vine can support itself, when the "shrub" is formed.

Trumpet vines are increased from root cuttings and by grafting on pieces of root. Nurserymen do not like grafted plants for their own use, as it renders the mistake easy of propagating from roots which may not be those of the one it was thought to be. For setting out on private grounds it makes no difference.—JOSEPH MEEHAN.

SHRUBS.

Some of the finer varieties of flowering shrubs are, by grafting, worked on to the common sorts, but all lilacs and prunus, including the best varieties, as also the two or three forms of Deutzia gracilis, grow willingly and rapidly from cuttings. They are best propagated from semi-ripened wood in early fall, so that in the following spring nice young plants are available for planting out in the field. Here they will rapidly grow into size, if properly attended to as regards pruning, hoeing, watering, and sprinkling in hot, dry, and windy weather. Pruning, however, is the most important part. The first and occasionally also the second year a judicious stopping, more or less severe, all according to variety, is necessary of shoots too forward and growth too rank. But at all times during the period of their nursery culture must weak, distorted, or straggling growth and superfluous shoots be cut clean away or broken off smoothly. This latter, if wanted, may be used for propagating. To obtain a firm and small-sized ball of roots, desirable when putting up, root-pruning is resorted to. In early fall a sharp spade is used to cut away the straggling roots all around the plants within reasonable distance from their base. This should be done every fall, every succeeding year cutting a circle a trifle farther away from the stem than the preceding season, and in their last year it is done a few weeks before they are dug up. The majority of those plants, recommended as most tractable under this culture, will, if carefully attended to, at the end of the third and many at the second year, be nice, well-formed bushes from 1½ to 3 ft. high with from 12 to 20 strong shoots, profusely set with bloom buds. Only specimens of this description should be selected for forcing in pots. In April they are dug up, those of the desirable size and shape potted up at once, and all plunged in the frames ready for them. These frames must be so constructed that in times of heavy rains raised sashes will keep the plants dry. A moderately moist soil or other material, in which the plants are plunged, will afford sufficient protection against a thorough drying out of the roots, which should be avoided at a time when the wood is ripening. Thoroughly ripened wood assures success in forcing hardy shrubs. A few snappy frosts will help to ripen it, but when winter sets in for good, the frames should be covered and protected against a solid freezing up, which would render the removing of the plants to the greenhouse later on inconvenient and difficult, and would also cause a cracking and loss in pots.

A better and more satisfactory pot plant is invariably obtained if plants suitable for this purpose are potted either in the fall or spring previous to time of forcing. This gives them an entire season in the open to become thoroughly established in the pots. The adoption of this plan becomes an absolute necessity if the plants are wanted for extra early forcing. If they are induced by a short period of greenhouse culture in early spring, to make and complete their season's growth long before those outdoors would, fine material is secured for very early forcing the coming winter or fall. The soil in the field should be good, well enriched, and freely worked, while that for the benches and pots need not be of a kind planting is of greater importance. especially prepared; a firm potting and

ETHERIZATION OF PLANTS.

Dormant plants, otherwise fully prepared and ready to be forced into bloom, if subjected to the action of ether directly before being placed into the forcing house, will expand their flowers sooner and with greater certainty than plants of the same lot not so treated. This process, new and only sparingly tried by florists, promises to become a great help to those in search of methods that will hasten the production of flowers for the early winter months, and no doubt would prove highly remunerative if properly turned to account.

Etherization does not, to any appreciable degree, affect such plants as roses, azaleas, rhododendrons, deutzia, spiræa, viburnum or peonies—not sufficiently to justify the use of ether in connection with their culture as a profitable measure. If, however, this seemingly drastic process is allowed to have fair and full play on lilacs, cydonias, plums, and cherries, it will easily be recognised as a long step forward in floriculture. It will cause these plants to open their flowers in less than half the usual time required. The most responsive sort of the lilacs are Syringa Mme. Lemoine and S. Charles X, and of plums, Prunus nana and P. japonica.

It is absolutely necessary that plants set aside for etherization should be well established in their pots; and etherization does not in the least disqualify such plants for a similar course every year in succession. The process is simple and does not involve any great amount of labor, skill, or expense, and any florist may test the merits of this promising new wrinkle for himself.

On a small scale, but giving fullest satisfaction, an experiment may be made in the following manner: The plants are set close together in an air-tight ordinary wooden box, we will say, one 3 ft. long, 2 ft. wide, and 4 ft. high, or any tight box having a clear inside space of from 20 to 24 cubic ft. Between the pots and covering the same up to the base of the stems goes a layer of sand, which is to protect the roots from the gas. A small shelf or a stout wire-ring or bracket is fastened in the upper part of the box as high up as possible. On this is placed the dish or open vessel containing the liquid ether. For a box of the given dimensions close to 7 oz. of commercial ether are required. After the ether is securely placed on said shelf or wire support, the box is quickly closed and made tight. This operation should be undertaken in a greenhouse, or shed, with a temperature of at least 55 degrees. If much cooler a greater dose of ether will have to be given. The box remains closed for from 40 to 45 hours. In opening it on the second day it is safer to keep away lighted candle or lamp. The plants are now taken out, thoroughly sprinkled, and at once subjected to forcing. Any delay would diminish the effects of the ether. Treatment from now on is the same as that accorded other plants in process of forcing. It is an interesting fact, worthy of note, that lilacs, which are hastened most by etherization, are also of all hardy shrubs those most easily retarded by cold-storage treatment.—FRED. W. TIMME.

THE TAMARISK.

As a seashore shrub the tamarisk is well known. Its value lies not only in its ability to withstand salt air and spray, but in the readiness with which it undergoes a good pruning. Cut it as you will, it does not object, but sprouts afresh, and really seems to enjoy the pruning. This is why it is so often used as a boundary to grounds near the seashore, where, when pruned as it should be, it forms a pretty, graceful boundary line, which no other shrub could produce as well. Then, if one wants a small tree, and not a shrub, the tamarisk is accommodating. Cut it down, selecting a strong plant for the purpose. Several shoots will, perhaps, appear, which may be allowed to grow for a while, but should all be removed but the straightest and strongest. Remove the others gradually, not all at once. The straight, central one left will make a tree. Watch it, that it makes an ascending growth, and the tree shape will follow in time. Nice ones, 10 to 20 ft. high, are made in this way.

PRUNING AND RAMMING TRANSPLANTED STOCK.

When extensive plantings are undertaken, it is almost impossible to have every tree or shrub set out properly pruned and firmed, and it is well worth while to have a man detailed to go over a block of freshly planted stock to attend to these two things. The first thing should be the firming of the soil, and this is done with a rammer. The soil is pounded down around the specimen until it is firm, when it may be considered the soil is in contact with the roots. In light, sandy soil there is no difficulty in getting the soil compacted; in fact, many advocate the use of sand for filling in about the roots of trees, knowing that it almost ensures their well-doing. The ramming of the soil should not be done in wet weather, but when the soil is dryish, for if rammed when wet the ground is apt to bake in hot weather.

To be pruned when transplanted is something almost every tree needs, and all can stand. Even those with good roots, which would grow without pruning, are none the worse for it, the strong growth pruning promotes well making up for what is lost by it. Therefore, a pretty close pruning should be given, keeping in view a good shape at the same time.

Evergreens need care in pruning, for the reason that they will not break satisfactorily from shoots from which all live foliage has been cut away. In the case of some pines and other evergreens, if every bit of foliage is cut away there will be fresh shoots from old wood, but when some branches are permitted to carry foliage and others are not, the latter ones will not break afresh, or but feebly.

CARNATIONS.

GROWING SEEDLINGS.

(Read by GEORGE M. HOLLIS before Toronto Gardeners and Florists' Club.)

I grow quite a few carnation and chrysanthemum seedlings every year; so far have met with some success, and hope to get higher up the ladder before I give up. I should like to see more growers take it up. We in Canada should be able to do something to hold our end up and bring out a variety that would be a credit. The raiser of seedlings must not be disappointed at not getting anything good the first, the second, or even the third year, but after that he should have some success. In the first place, he must make a start and the plants raised the first year should be the foundation of the seedling stock. The color of the flower does not matter much provided the plants are strong, with stiff flower stems, and an upright growth, the flowers not very full in the petals and calyx non-bursting. Select the plants you mean to seed as above. Take the pollen from some healthy, strong-growing plants, never weak, puny ones. Nor is anything gained, I think, in getting all the new ones to work with, unless some new variety would give you some advantage in vigor, also in size of blossom. But with good judgment in selecting your seedlings, it is better to work with them.

In the dull days of winter it is not so easy to cross the flowers as during the warm, bright weather of early summer, as many varieties have no pollen anthers before they burst. The petals should not be cut off, and two days after the pollen can be put on the pistil, bringing it to the flower with a pair of small forceps. Do this about noon when the sun is shining, and, if successful, by next day the flower will close; if not, repeat. After a few days pull out the dead petals. Some varieties will not seed, but the pollen from them, in nearly every case, is wonderfully effective.

Label your crosses and keep an account of them. When the seed pods show signs of bursting, gather and put each in a separate paper and keep in a tin box in a cool, dry place till sowing time. The best time for sowing, I think, is February. The seedlings can be grown on in pots, or flats, and planted outside in May.

Do not stop the seedlings. Let them flower; and do not be afraid to pull out the bad flowers and the poor growers, and after planting inside you will have more to pull out. Out of five hundred you may end with twelve or less. Cross them again and sow. Select and house as before, and propagate any you think worth saving. They may be good as seedlings, but when grown from cuttings they may be far from good.

o be continued.

The Orchard.

OPERATIONS FOR JULY.

By James Lang, Harcourt.

Planting operations will be the principal work of the month, the soil being now in the best condition for carrying out this work. The distance to plant the trees will depend a good deal on the size of the orchard. In a small place, intended principally for home use, 15 ft. apart will be ample, while in a large orchard 20 ft. will be none too much. This gives plenty of room for working the orchard with horse labor. Be careful not to plant the trees too deep, the same depth at which they were growing in the nursery being a safe guide to go by.

Selection of Varieties.

In the selection of the varieties of fruit to plant, consideration will have to be given to the purpose for which they are required. The supply of fruit now seems to have overtaken local consumption, so that more attention will have to be given to those varieties that are suitable for export. This will confine the choice in the case of apples to those varieties which realise the best prices in the markets of the world. Cleopatra, Jonathan, and Munroe's Favorite are at present the leading kinds in Covent Garden market; while the same varieties bring the best price in the markets of Germany, Cleopatra especially being a great favorite with the Germans, from its beautiful golden yellow, and its sprightly juicy flavor. This variety has not been much grown in the districts around Melbourne, owing to its being affected with the scab; but I think it is worthy of further trial, especially as the Bordeaux mixture has been found to be an effective remedy for fungus diseases. In the warmer districts of the State it is found to do well, and is not affected to any extent with the scab. It would do well, therefore, in districts where these varieties succeed, to plant the greater portion of the orchard with them. Other good kinds are Rome Beauty, Esopus Spitzenberg, Dumelow's Seedling, and for later shipments, Sturmer Pippin and Newtown Pippin. In pears suitable for foreign markets, Winter Nelis, Josephine de Malines, Vicar of Winkfield, and Beurre Clairgeau have so far carried well and realised the best prices.

I now append a list of fruits, being the best to plant for home use or market purposes:

Apples.—Williams' Favorite, Gravenstein, Emperor Alexander, Jonathan, Reinette de Canada, London Pippin, Esopus Spitzenberg, Cleopatra, Munroe's Favorite, Rome Beauty, Rymer, Stone Pippin.

Pears.—Williams' Bon Chretien, Doyenne Boussoch, Buerre de Capiaumont, Beurre Bosc, Beurre Hardy, Beurre d' Anjou, Broompark, Josephine de Malines, Winter Nelis.

Plums.—Early Rivers, Early Orleans, Angelina Burdett, Diamond, Washington, Yellow Magnum Bonum, Pond's Seedling, Cole's Golden Drop.

Apricots.—Oullins' Early Peach, Royal, Hemskirk, Mansfield Seedling, Moorpark, Dundonald.

Cherries.—Early Purple Guigne, Burgdoff's Seedling, Twyford Bigarreau, Eagle's Seedling, Bedford Prolific, Florence, St. Margaret.

Peaches.—Briggs' Red May, Amsden's June, Hale's Early, Lady Palmerston, Crimson George, Royal George, Foster, Salway.

Figs.—White Genoa.

Black Currant.—Carter's Black Champion.

Strawberries.—Edith, La Marguerite, Trollope's Victoria.

SOIL SURFACES IN THE GOULBURN VALLEY.

By C. Bogue Luffmann.

Agriculturally considered, this region is not a valley, but a broad and indifferently drained plain. The soil varies considerably, in both depth and character, and is underlaid by strata more or less valuable in the way of providing food and drainage.

What the Soil Rests On.

In such a region, and especially when subjected to irrigation, what the soil rests on is often a more important factor than the soil itself. We repeat under drainage, because water which runs over land by surface fall, or which stagnates till it is absorbed into the atmosphere, sooner or later destoys the total principles of the soil and prevents plant growth.

The Movement of Water and Soil.

Water to improve soil and preserve the growth of crops must pass more or less rapidly and laterally through the soil, therefore land which will absorb water several feet from a channel is more fertile and profitable than such as absorbs it for no more than a few inches. Very porous soil over loose drainage material soon becomes exhausted through the finer properties filtering down and being carried away in the drainage, thus we are brought face to face with several subjects all of vital interest to the cultivator of flat land.

The Inertness of Flat Land.

In the first place, flat lands of any extent accumulate least material on their surface; and, secondly, they are subject to the slowest processes of "weathering," or the conversion of sub-material into true soil. High winds and fierce desiccating heat are the prime causes of flat lands gathering least on their surfaces, and the lack of movement or exposure of the subsoil effectively prevents its becoming weathered and improved.

Flat land is for various reasons the most inert, and therefore the least generous. It can do little of itself, and calls for more skill and industry in the way of preparation and cultivation than soil in any other situation.

The agriculturist who would secure the highest returns from flat areas must, therefore, set himself the task of providing more movement, more air, a cooler summer surface, and a better under drainage system than exists naturally.

Bad drainage either robs or clogs land, either of which is sufficient to render it unprofitable. Water moves in three directions and yields more or less according to the course it takes. It may spread laterally as through a loose humic soil, it may pass downwards as through a sandy surface material overlying a porous wash or clay, or it may lie on a close non-porous clay or cement-like material until it is drawn off by the heated atmosphere. In practical agriculture the latter should never be admitted; soil moisture must and will escape, but no free water should lie on the surface for more than a brief period. Should it do so we know that the land is distinctly unsuitable for irrigation, or that it has been badly laid out and surface formed.

The Factors in Soil Fertility.

There are three factors in soil fertility—they are its chemical composition; its physical nature; and its mechanical condition.

We will explain what these mean. The chemical composition of a soil means all it does or should hold in the way of foodstuffs which the selected crops require. The physical nature of soil means the size and arrangement of the soil grains, as, for example, sand may be fine or coarse; clay smooth or gritty; loam heavy or light; and then each or all of these may be in separate layers or blocks, or be equally blended throughout the entire mass.

The mechanical condition of soil means either its natural powers of movement or that which we may secure by cultivation.

Until comparatively recent times the chemist thought most of the chemical composition of soil, whilst the experienced agriculturist paid most attention to its physical nature and its mechanical condition.

Now, however, we have demonstrated beyond doubt that the physical nature is of the highest importance. The other two are not to be thought lightly of, but the point is this: we may have a complete soil anywhere in the world, and yet obtain nothing from it unless the various elements are properly blended.

The best soil is therefore that which is most mixed, and that which yields most is that which moves and changes oftenest, for there can be no mechanical movement without physical and chemical change, and in this changing is plant food evolved and supplied.

Now, what does this mean but a confirmation of what has been said already,, that flat land is the most inert. It cannot move of itself, and we have the hardest task to keep it moving.

The Surface Form Appropriate to the Soil and Position.

Our first concern is therefore to improve the levels as far as possible, so as to ensure the necessary soil movement. Admit that water passing through soil causes it to move and mix, and open drains or ditches are seen to be of great advantage.

Wherever drainage is bad or soil flat, the head drains or ditches should be most frequent. And in making ditches one makes soil, since the material taken out can be employed in enriching weak spots or in filling bad hollows and soaks.

Plotting for Irrigating Lucerne.

To come to particulars, different crops call for different methods of plotting, irrigating, and draining. This article shall be confined to the wants of lucerne, orchard, and vine land.

None of these should be flooded, or, at most, it should be limited to lucerne paddocks formed on loose, elevated sand, or where the under drainage is so perfect as to leave the surface free from water and a caking silt. By irrigating the flat, unbroken surface, as at present, the soil is being robbed, compressed, stratified, and hardened to the extent that drainage and the food supply becomes feebler from year to year. The soil is, in fact, hotter in summer through its increasing hardness, and colder in winter through its holding up water on its surface, or on a "pan" which is formed by infiltration.

To improve existing lucerne land, it should be closely furrowed; the stiffer the soil and worse the under drainage, the closer the furrows should run, thus they may be no more than six, though they may extend to twenty, feet apart.

To ensure effective surface drainage and aeration by these furrows, ditches should be opened on the lowest boundary lines, and, in the event of the paddock being large, one or more ditches should be made through it. It should be borne in mind that much more air is needed in irrigated soils than in those which go unirrigated, and that air can usually penetrate soil as far as the furrows and ditches descend into the earth; that is, if they are placed at close intervals. Silt, soil, and humic matter will always accumulate in the furrows and ditches to such an extent as to break up or "weather" a great deal of the hard material below and about their lines. This material should be ploughed out annually, thus deepening the furrows and securing a top dressing for the crop.

Complaints are common of lucerne dying out through the "boiling" it is subjected to by summer irrigation. This would not be the case if the land were first laid out in a series of bold ridges and furrows, aided by the necessary ditches. In the stiffer and worst drained lands of the Goulburn Valley water will soak up through soil faster than it will soak into it; by which we may discern that we should prepare for the water to run in channels bounded by bold ridges, into which the water can soak without overloading the soil or swamping the plant in any way. Another point of very great value arises here: the ridged surface is the coolest in summer and warmest in winter. It is only during the middle of the day that the whole of the surface comes under the influence of the sun's rays; the air is cool and less harsh when blowing over the ridged land; no dust escapes compared with that which is swept from flat and exposed surfaces, since what is blown from the face of a ridge drops into the hollow beyond. In winter the bulk of the ground stands high and dry enough to promote growth, not only in abundance, but of a sweeter and more nutritive character than comes from flat land. View it as we will, we are always able to find fault with and see waste and increased cost of production when dealing with flat land.

To Improve Orchard and Vine Land.

In existing orchards nearly all defects in trees and fruits, as well as the unequal appearance of crops, may be traced to the flatness of the land, and the defects it brings in its train. Certain difficulties exist, it is true, but so far as the present writer has seen, they are not insurmountable. The most stubborn defect is found in the low levels of the service channels, which prevent water travelling at sufficient speed over loose soils, or its being taken by tributary channels to the sides of orchard blocks, where it may be made to supply all ordinary wants without deluging any parts, as often obtains by the present method.

Outfalls for drainage are almost equally faulty. Heavy ditching leading to dams or 'borrow pits" should be employed to draw off surplus water, and when these are provided the land should be persistently ploughed to form ridges—the trees occupying the crowns and the furrows between serving as courses for irrigation water and drainage channels at all seasons. In particularly hard soils, or where trees are badly in need of water, cross-furrowing may be necessary that the water may penetrate the soil on all sides or the furrows may be reversed from year to year, or every second or third year, first taking them up and down, then across, or perhaps diagonally. This implies that the water should be entirely under control, which, of course, it should. The water must be tipped and turned hither and thither at will, or there can be no such thing as controlling the growth and value of trees.

Making due allowance for the unsuitable character of much of the land now under fruit trees, there is nevertheless the opportunity to vastly improve their condition and value. It may be said that the trees are suffering through the dead and stifling nature of the flat surface, and that the only work worth considering consists in ridging as far as possible every particle of matter which can be shifted by the plough and the scoop.

Make the headland low, putting any material obtained into low hollows or at the base of needy trees. If a hollow absorbs water freely and will not grow trees, accept it gladly as a drainage basin, and plan the surface accordingly.

Know the levels, depth, and character of soil on every part; know where water can be got on and got off. Know every item and influence which can possibly affect your land, and then proceed to make a surface plan. Don't sacrifice the needs of the trees to a particular plough or cultivator, or for the escaping day's hand labor. Put the trees first, and last, and always. A ten-acre block may call for watering from half a dozen points and in half a dozen ways, and your task is to know why, and then do it.

Don't think the land can be over-ridged. It can never be ridged enough. Half a dozen ploughings in one direction will not see it as many inches higher above the trunks after the lapse of as many months. Some trees and some soils, of course, need ridging more than others, but taking the Valley as a whole, all its fruit land should be as boldly ridged as possible for the reasons which have here been set out. As many will say, "What about cultivating?" the answer is—You need not! "Or getting under the trees?" and again you need not! You are neglecting the kernel for the shell.

In support of this article, one will soon be contributed on "The Soil Maker."

—Agricultural Journal of Victoria.

THE APPLE.

By W. J. Allen.

To the man who devotes the whole of his energies to the production of fruit, and to the farmer who desires to have a plantation of fruit trees which can be depended upon to return a good profit for all the labor he can bestow upon them as a subsidiary line, there are certain varieties of the apple worthy of consideration.

Throughout the tablelands, in certain sections of the coastal districts, and nearly everywhere on the western slopes, there are to be found soils and situations favorable to the perfect growth of apples, for which there is not only great local demand, but excellent opportunities in the export trade.

In Tasmania the apple industry stands relatively in the same position as wool-growing does in New South Wales. Not only does the Tasmanian apple-grower compete in a large way against all other countries in the British markets, but almost commands the apple trade of the capitals of the States of the whole Commonwealth. The Victorian and South Australian apple-growers also have during the last few years been able to secure a footing in the British markets. It can be safely said that in none of the three States mentioned are the conditions of soil or climate in any way more favorable for the production of high quality, long keeping, and good carrying apples than numerous districts of New South Wales.

The Department of Agriculture has for many years grown side by side at the different experimental orchards of Bathurst, Wagga, Richmond, and more recently at Glen Innes and Cowra, most of the varieties of apples to be procured in this and other States, as also some which have recently been imported from both England and America—all of which varieties are being grown and compared, with the definite object of determining which apples, under a given set of conditions, return the best results from a commercial point of view; and as a variety has been found to do well, not only under the conditions existing at the experimental orchard, but in private orchards, in which results are comparable, it has been illustrated in colors. The series is necessarily not complete yet, but at any rate the list will not be a long one, there being out of the nearly 700 varieties under trial and observation, possibly not a great many sorts that it is commercially worth while to grow on a large scale.

In Tasmania, the aim of the grower is to have as few varieties as possible, and in the great apple industries of the United States and Canada there is the same tendency. The only reason why so many varieties may be mentioned in this work is that New South Wales possesses so great a range of soils and climatic conditions favorable to apple-growing, that our growers can go further than the orchardists of most of the other States in catering for a wide range of market requirements.

THE GRAFT UNION.

By F. A. Waugh, Massachusetts.

The author has made a study of the nature of the union between stock and scion in hard-wood grafts. It appears that scion and stock do not unite like two parts of a broken bone, but remain totally distinct and separate. The new wood which forms after the graft is made is continuous and normally forms in annual unbroken layers like the layers of an ungrafted stem.

By sectioning a large number of grafts it was found that "in spite of the longitudinal continuity of the annual layers, there is sometimes, at right angles to them, a visible line of demarcation between the wood grown from the scion and that grown from the stock. The two kinds of tissue are sufficiently unlike that the difference can be noted with the naked eye. Moreover, in some cases there is a distinct line which seems to form a boundary between the two members."

The idea that new kinds of plants can be produced by the grafting of divers scions and stocks is held to be erroneous. "No matter how closely the two kinds of cells may lie against one another, their contents are never mingled in the production of a new cell. Each new cell is produced by the division of some older single cell, never by the fusion of two parent cells. . . . The two kinds of tissue may commingle or lap in together somewhat along the line of junction, but this mixture is only mechanical, not physiological." The same kind of union and growth occurs in grafting by budding as in long-scion grafting.

The graft is not necessarily the weakest point in the limb. It has been observed that when the wind breaks off branches in an old orchard that a majority perhaps of the fractures do not occur where the grafts have been made, but elsewhere on the limb. In the case of defective unions caused by some incompatibility of scion and stock the graft is a source of weakness. Defective unions as a rule have not been found to be due to faulty technique in grafting, but rather to incompatibility of stock and scion.

"In the case of imperfect unions, the continuity of the new growth is more or less interrupted by the deposition of a certain amount of loose scar tissue such as serves in the healing of wounds. These conditions make the graft union mechanically weak. All degrees of mechanical strength may be observed in graft unions, ranging from those (a large number) which are stronger than the adjacent parts of the same stems down to such as are incapable of even holding themselves in place."—Washington Experiment Station Record.

Vegetable Garden.

OPERATIONS FOR JULY.

By W. S. Campbell.

This is the time of midwinter, cool in some parts of New South Wales, cold in some few places, and mild or even warm in others. It will, therefore, be apparent that it is practically impossible to write one set of directions to apply to the whole State, which enjoys such a variety of climates; frosts, snow, and ice in some of the elevated districts in the beginning of May, following, suddenly, quite warm weather. Here the growing of tender or half-hardy vegetables is a thing of the past, and further sowing must await until spring or early summer returns. On the other hand, in some favored localities in the northern coast districts, French beans, tomatoes, and potatoes can be grown the year round, but such localities are limited.

Wherever any portion of the land set apart for vegetables may not be required during the cold season of the year for cropping, it had better be dug up roughly, in order that as much of the soil as possible may be exposed to the weather. This should improve it to a considerable extent.

The present is a good time of the year to start the making of vegetable or flower gardens, and it would be advisable to perform the preliminary work as thoroughly as possible, for such a good chance is not likely to occur after the land has once been put under crop. Have the land trenched 2 ft. deep, but avoid bringing up the subsoil to the surface, or there is likely to be trouble in store for the gardener, and it will take a considerable time, very probably, before the undesirable subsoil can be worked into a suitable condition for either vegetables or flowers. Of course, this does not refer to soils which are much of the same character from the surface to 2 or 3 ft. or more below it. Such fine soils do exist in many places in the State, and when lying situated in suitable positions for the garden they should be made good use of. I have frequently seen instances where most excellent soil exists on farms close up to the residences, of which no use whatever is made for garden purposes, and the families enjoy neither vegetables, fruit, nor flowers of their own production.

Should it not be convenient, for some reason or other, to hand-trench the garden, do the next best thing if possible—plough, and then subsoil-plough the land; but no machine-work can come up to hand-work for garden purposes. The nearest approach to it is with the disc-plough work, but the disc-plough is not quite suitable for all kinds of soil.

After the preparation of the land, the subsequent work will probably have to be confined to hand-work, for when the garden is properly enclosed the area will be too small to admit of horse-work.

There are numerous handy implements, such as wheel hoes, with combinations for making furrows, seed-sowers, &c., which can easily be obtained. If any such implement be used, it will be desirable to make the rows of vegetables continuous—for instance, instead of having say three or four short rows of cabbage have one long one where practicable, or, if only one short row be sufficient for family requirements, plant or sow something else in the same line, and so on. In this manner the work of cultivation is straight ahead, and there will be fewer turnings.

Artichoke, Globe.—Suckers or rooted plants may be planted out during the month, but this work is likely to prove most successful if it be postponed until the early spring. Plant at least 3 ft. apart; 4 or 5 ft. would be, perhaps, better. This vegetable is hardly worth the growing, but as some persons like it a plant or two might be tried.

Artichoke, Jerusalem.—This species of sunflower is quite another thing to the Globe Artichoke, and is a very desirable vegetable to grow. When the tubers, which are somewhat like potatoes, are in proper condition, the leaves and stems wither away or die down. The tubers may be lifted and stored, or allowed to remain in the ground, to be taken up as needed. They do not store very well, and are liable to decay. Keep enough tubers in the soil for next season's planting out in the spring. In suitable places the yield of this plant is sometimes enormous.

Broad Beans.—Early plants should by this time be bearing pods large enough for use. Sow a row or two, according to requirements, at any time during the month. Gather the pods before the beans become over-large.

Cabbage.—Plant out a small batch of strong seedlings, and sow a little seed in order to keep up a supply of young cabbages. A very little seed need be sown. Vast quantities of seed is wasted and seedlings raised in huge numbers at a time, but most of them are never made use of.

Endive.—A useful winter substitute for lettuce. Sow a little seed. Plant out strong seedlings.

Carrot.—Sow a little seed occasionally. Thin out seedlings well, and never allow carrots to become overcrowded or to be spoiled by weeds.

Leek.—Sow a little seed in seed-bed, and transplant to shallow trenches when large enough—say, when the stems are half as thick as one's little finger; or when they are as one's thumb they may still be planted. The soil should be made very rich for the leek, which vegetable will need a good deal of moisture to enable it to grow to perfection. When nearly full grown the stems may be earthed up, in order to make them white and tender.

Lettuce.—Transplant young seedlings that seem large enough to stand the moving. Take up with a trowel after they have been treated to a good soaking with water, unless the ground may be sufficiently moist already. The less the roots are broken the better the young lettuces will grow.

Onion.—Sow a little seed occasionally, if a continuous supply be required. Attend well to seedlings which have appeared above ground, and keep down weeds without fail.

Parsnip.—If a large supply of this vegetable be required, seed may be sown to any desired extent.

Peas.—As this is one of the best vegetables any one could grow, an endeavor to keep a supply going should be made. Plants well grown should be producing abundance of peas. The pods should be gathered whilst they are young and the peas tender and eatable. Do not allow any peas to ripen, and the plants will continue to produce much longer. Try several varieties. Sow as freely as you like.

Radish.—Keep a supply going by sowing a few seeds two or three times during the month. A very little seed is likely to suffice. Manure well with rotted dung. Cowdung will most likely prove to be the most satisfactory. Use the radishes whilst they are quite small and tender.

Mustard and Cress.—Sow a little seed now and then during the month. These salad vegetables can be kept going all through the year without very much trouble.

Herbs.—In warm localities all sorts of herbs may be planted or old plants can be taken up divided and replanted.

LUTHER BURBANK ON POTATOES.

Luther Burbank has again been heard from in connection with astonishing experiments he is making to produce new potatoes, tubers that may eclipse any other yet given to man. Chief among this experimental work is the crossing of the Solanum Commersoni, a wild species of the potato which grows on the Mercedes River, in South America, with the common potato. The South American tuber was discovered some ten years ago, and specimens were taken to Paris, and for almost a decade Dr. Heckel studied and tried to hybridise it. Finally he sent Luther Burbank a single eye, and twelve months after the distinguished California scientist commenced his experiments he had secured 120 hybrid seedlings from it. Also is Mr. Burbank experimenting with another new species of tuber, the Solanum Magli, which grows on the west coast of South America, in the high mountains. He also is using in his new tuber experimentation other varieties, including the hardy potatoes that grow in some parts of the mountains in Arizona, in Central America, and in the high mountainous country of old Mexico. The hardy qualities of these wild potatoes, so to speak, are being combined with the ordinary tuber, which has, to a certain extent, almost run its race of service. Regarding this new potato, Mr. Burbank said: "It will be better in quality, better in flavor, more productive, and of more even size, so as to do away with small potatoes altogether," and then, reserving the best quality and most important, to the last, "it will be a potato that will resist the various diseases known to the tuber family. The resistant feature in this creative work is the most difficult." Mr. Burbank further explained that the common potato, the Solanum tuberosum, has practically lost the power to produce seed balls. Crossing the old varieties with the new ones will necessarily result in the introduction of new varieties that will have new qualities.

"About how many varieties of potatoes have you on hand now, Mr. Burbank, with which you are experimenting to produce the new potatoes?" he was asked.

"Over 10,000," was the ready response. Most of the 10,000 varieties are hybrid seedlings of Mr. Burbank's own creation. These have been produced by crossing, followed by careful inspection, testing, and selection. April 27 Mr. Burbank commenced the planting of the 10,000 varieties on his experimental grounds. The potatoes are of all kinds and shapes—some round, some square, some long, some short, of all colors of the rainbow. There are pure white tubers and black ones, pink, red, crimson, purple, yellow are among the colors of the potatoes that are being planted. When the harvest time comes in the Fall, possibly all but 100 varieties out of the 10,000 may be rejected, and the following year probably this number will be reduced two-thirds; and so on until perfection is attained. "It will take two or three years at least," Mr. Burbank said, "to produce the new potato, as all the varieties must be put through the testing process."—Alvin.

EXPERIMENTS ON THE MANURING OF TURNIPS.

This year the experiments were carried out on 21 farms, and the objects of the work were mainly to determine the best method of applying nitrate of soda, and the quantities of kainit and superphosphate most profitably given to the turnip crop. These substances, together with sulphate of ammonia, were applied in different quantities and combinations; and the use of barnyard manure at the rate of 10 tons with 5 cwt. of superphosphate per acre, or at the rate of 20 tons applied alone, was also tried.

The results obtained indicate that where nitrate of soda is the sole source of nitrogen, one-half should be given in the drill and the rest as a top dressing after thinning. When the entire quantity was applied, either in the drill or as a top-dressing, the results were much less satisfactory; but of the two methods, application in the drill seemed preferable. It was found that sulphate of ammonia as the only source of nitrogen was more effective in some seasons than nitrate of soda. The most profitable returns were obtained where one-half the nitrogen was given in the drills in the form of sulphate of ammonia and the remainder as a top-dressing in the form of nitrate of soda.

The omission of potash from the fertilizer application caused a great reduction in yield. Kainit at the rate of 2 cwt. per acre in the fertilizer application was sufficient to give a large increase. The maximum quantity to be given profitably with other fertilizers is believed to be about 4 cwt. per acre. It was shown that 4 cwt. of superphosphate per acre is frequently sufficient for turnips, and that more than 6 cwt. is not likely to be profitable.

The tests further demonstrated that turnips can be grown with barnyard manure or with commercial fertilizers, but that generally the use of both together is likely to be more satisfactory. The plot receiving 10 tons of manure and 5 cwt. of superphosphate yielded on an average 23 tons 8 cwt. of good turnips per acre. Applications of commercial fertilizers when not well balanced, and heavy applications of barnyard manure alone, had a tendency to reduce the quality and to render the crop more subject to disease. Where barnyard manure was applied with superphosphate the quality was not so much reduced, and the yield was also greater.

EXPERIMENTS ON THE MANURING OF POTATOES.

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(By R. P. Wright.)

The general conclusions of this year's work are that large crops of potatoes can be grown with the use per acre of 20 tons of barnyard manure alone, of 10 tons of manure supplemented with commercial fertilizers, and also by the use of commercial fertilizers alone. The amount of increase from the use of manures and the resulting profits were found to be largely dependent upon the variety, a strong-growing, productive variety being usually the most profitable.

The increase in yield with manures was entirely due to an increase in the size of the tubers. Light dressings of barnyard manure produced much better results than the same quantities employed as heavy dressings. The use of 10 tons per acre, either alone or with commercial fertilizers, was very remunerative. Commercial fertilizers were more effective when used with light dressings of manure than when given with heavy applications.

The best cooking quality and highest nutritive value were obtained in the crop grown with commercial fertilizers alone, the particular application consisting of 6 cwt. of superphosphate, 2 cwt. of sulphate of ammonia, 1 cwt. of nitrate of soda, and 2 cwt. of sulphate of potash per acre. Heavy dressings of barnyard manure alone produced watery tubers, but light dressings were less injurious, and commercial fertilizers applied with the manure had a tendency to counteract its unfavourable influence upon the quality. Considering both quantity and quality, the use of light dressings of barnyard manure, together with suitable applications of commercial fertilizers, is believed to be the best practice.

Potash in commercial fertilizers given with barnyard manure increased the dry matter and starch content of the tuber, and the data indicated that about 84 lbs. per acre furnished in 1.5 cwt. of sulphate of potash was the most profitable quantity. With barnyard manure either high-grade sulphate or muriate of potash should be used, and with commercial fertilizers alone the commercially pure sulphate of potash should be employed. In these experiments sulphate of potash gave the finest quality of tubers, while those grown where kainit was used were much inferior in quality. Muriate of potash produced potatoes intermediate in quality between those grown with sulphate of potash and those grown with kainit. The muriate had similar effects on the quantity when only commercial fertilizers were employed, but with barnyard manure it was sometimes as effective, or even more so, than sulphate of potash. Where commercial fertilizers were applied a top dressing of 1 cwt. of nitrate of soda per acre immediately after the first weeding had no injurious effect on the quality.—Experiment Station Record, Washington.

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Adiantum nebulosum—A most elegant Fern, with very light and graceful fronds. The multiplicity of minute pinules and the almost invisible ramifications of the rachis impart to the plant a peculiarly charming appearance. The texture of the fronds, which are about 1 foot long, and 8 to 9 inches across, is thin and very fragile. The color is very pale olive green. 3s. 6d. each.

New Petunias.

Blue Queen—Lavender blue, nearest approach to blue yet sent out; flowers large, double, and nicely fringed, 2s. each.

Squire Dutton—This I consider one of the very finest double Petunias it has been my good fortune to raise. The plants are dwarf and compact, and the flowers very large and full, magnificently fringed, and of a new shade of color, rosy peach, tinged violet amaranth; quite a gem among Petunias. 2s. 6d. each.

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ROSES

The rose garden will require special attention. Manuring and digging having been completed and standards staked, the growth will be advancing, and it is at this period that the first effort should be made to combat the attacks of aphides, which, if allowed to breed unchecked, often destroy the beauty of the rosary. They will cause but little trouble if the rose trees are sprayed occasionally with soapy water or a solution of Burford's emulsion. A gallon of water provides mixture enough to destroy any number of them

CARNATIONS

Propagate carnations by slips or shoot pulled off the sides of the stems, Trim off the lower leaves and pot them, six in each 5-in pot using a compost of equal parts sand and good soil, The pots should be set in a glass frame, which must be kept closed and shaded from sunshine The tree kinds of carnations are amongst the most useful, as well as the most beautifu of flowers, as they are scarcely ever without blooms. The carnation has grown rapidly into avour.

BEGONIAS

Another grand flower which has found favour is the tuberous begonia, on account of its easy culture and splendid flowering qualities. The begonia, whether double or single, deserves a place in every garden. It will now be emerging from its dormant state, and will require a little water. All the old soil should be shaken from its roots, and it should be repotted in a mixtur of peat, decayed manure, and sand.

ANNUALS

Hardy annuals may be planted, and care should be taken to water them so soon as planted. A little short manure put round them as a mulch would prove of great assistance

Sow in warm, sheltered borders seeds of early, summer annuals; the soil must be very finee with a good proportion of sand, and should b kept constantly moist. Manure and fork amongst chrysanthemums and roses.

Plant phlox, calliopsis, gaillardia, mignonette salpiglossis, also perennials, as petunia, verbena, perennial cosmos, delphinium, antirrhinum, &c

A London Letter.

By A. Hemsley,
in "The Florists' Exchange."

The Royal Horticultural Society.

Continued prosperity seems assured to this society. The shows at the new hall attract large numbers of visitors. At the last, one of the most prominent features was a large group of platyceriums from Messrs. Hill & Son, Edmonton. I have often advocated these quaint ferns for decorations, and I feel sure that there is money in them. A gentleman in America, writing me some few years ago, told me that he found them do better in the house than any other fern that he had tried, and they were always a source of interest to those who had not previously seen them. The sorts Messrs. Hill showed were alcicorne, æthiopicum, also known as straminea, Willincki, Veitchii, Hillii, angolense, and a magnificent specimen of grande. The two first named are the most useful for general purposes, and these may be readily propagated. If fixed on blocks of peat, root bulbils are readily formed, and these soon develop into young plants which are easily detached, and will soon grow into a useful size. Hobbies, Ltd. (J. Green) showed rose Philadelphia Rambler. It was hardly up to the standard as regards culture. Yet it was evident that the individual flowers are better and the color a more pleasing shade than is Crimson Rambler. Messrs. Robert Veitch and Son, Exeter, again showed their Erica Veitchii, this time a compact plant densely covered with bloom, and an award of merit was given for it.

In roses shown by George Mount, Liberty and Ulrich Brunner were the best reds. Captain Hayward was also good. Mrs. Sharman-Crawford, one of the best of several pinks. Messrs. Cutbush & Sons, Highgate, showed carnation General Kuroki, a very fine scarlet variety, of habit similar to the American varieties. This gained an award of merit.

Magnolia Campbellii, from a private source, was one of the finest we have seen, the large flowers being of a beautiful rosy pink on the outer and nearly white inside. Lathyrus pubescens, a very pretty azure blue variety, with rather small flowers, and about a dozen on each stem, came from the gardens of Leopold de Rothschild. S. Mortimer, Farnham, showed a fine wallflower-leaved stock with large double white highly fragrant flowers. It was named "All-the-year-round," and is said to flower at any time according to the time the seed is sown. It should be useful for market. H. Langston, of Marston, Herefordshire, showed violet Princess of Wales, one of the finest blues we have. The flowers shown were of remarkable size. We also see this fine variety in the market, and there is no better, though La France may run it very close.

ORCHIDS.

The steady growth of the orchid in popular favor has led to its special cultivation commercially. In the picture of the "Willowmead Orchidry," at East Orange, N.J., is given a type of modern orchid house, with its rows of suspended pots and baskets—the Willowmead pot and basket, in this case—and its benches well filled with plants in the double pots. Its owner, Dr. J. M. W. Kitchen, has told his experience repeatedly before gatherings of the craft and regards the cultivation of the orchid as a simple thing as long as a few general principles are observed. The doctor's inventive genius has directed itself also in the direction of heating, and the visitor is shown the "Torrodoor" fuel and heat saving appliance, which can be attached to any furnace, and which will pay for itself in a remarkably short space of time. A manual describing the appliance he sends any interested reader.

The picture represents the main house opening out of which are ten smaller ones, which are used for the cultivation of special kinds or for resting. The presiding genius of these is W. Warner, who will be remembered by the visitors of former times to the houses of Pitcher & Manda, at Short Hills, N.J. Some of the results in the flowering of these plants are given in the pictures of the cattleyas and dendrobiums.

The great difficulty of the leading florists now is to find flowers sufficiently rare and expensive for their best patrons, who do not wish to wear such things as common folks can afford, and here and at the other establishments devoted especially to the orchid are found full gratification for this feeling. "What does the retailer get for an orchid bloom for which he pays me one or two dollars?" asked Dr. Kitchen at a gathering, where a prominent florist was present. "It depends upon just how much the fellow around the corner is asking," was the very diplomatic reply.

The expenditure of from 3,000 dollars to 5,000 dollars for flowers at fashionable weddings is not at all uncommon now, and a decided increase in the employment of the orchid in the farewell floral offering to the passenger upon our outgoing steamers because of its valuable keeping qualities is on the increase. It is the rarest of all Easter plants, the graceful poise and dove-like form of some of its species making it particularly appropriate upon this anniversary.

Orchids bearing flowers in racemes are becoming popular at the present time for table decoration, because of their graceful combination with asparagus and adiantum, and are even sold in their pots and baskets for gifts because of the continuous bloom of one plant for several weeks. Nor do all orchids resent greatly being taken from the conservatory to the drawing-room, though it frequently means to the grower the sacrifice of the next season's flower, but even this has been found an advantage, for from the enforced rest has come increased size of the next following season's bloom.

As we understand the cultivation of the orchid better, the number of flowers upon a single plant is increased through the skill of the grower. An example of this is mentioned at an exhibition at Sandown, England, where a plant of the widely known Dendrobium nobile was staged bearing no fewer than 1,350 blooms. The science of window-gardening, yet in its infancy in American cities, has many valuable additions in the orchid, when our dealers wake up to this fact, particularly when simple instructions for their cultivation accompany the sale of each plant. As its capability of harmonious arrangement in evening costume has so recently been discovered here, though extensively practised abroad, our florists find in the orchid not a flow-the connoisseur alone, but for the house and all branches of decorative work. The display of a few choice photographs of these flowers, particularly if colored, materially assist the sales.—Jos. B. Davis.

All orchids make up well with ferns, particularly of the adiantum varieties. No flower suffers more from injudicious combinations. Cattleyas and Roman hyacinths make an ideal decoration. Freesias work in well and mignonette and Roman hyacinths with C. Schroederæ, but with none other on account of color. Cypripedium insigne and freesias harmonise and make a striking decoration by skilful association in either plateau or epergne methods. D. Wardianum, C. cristata and C. Schroederæ make up well in mantel decoration with Asparagus Sprengeri or A. plumosus.

The Cultivation of Peonies.

Robert Tracy Jackson,
Boston Gardeners and Florists' Club.

Herbaceous peonies are mostly of the easiest cultivation. Full sunshine, or at least a good exposure to the sun, is necessary, as they do not thrive in the shade, as under trees. The roots of trees or large shrubs are objectionable, especially elms, maples, and lilacs, as absorbing the nourishment and water needed for the full development of the peonies. A location protected from the force of the wind is desirable where possible. Peonies will stand great variation as regards soil, but a heavy rather than a light sandy soil suits them best. Being strong feeders and vigorous growers, they should be given deep cultivation, 18 in. to 2 ft.; even more is recommended by some, but I have had good results with 2 ft. An abundance of barnyard manure should be worked well into the soil, especially before planting. If this manuring can be done some months previously so much the better. Cow manure is best, when available. Peterson says that where propagation is the feature desired, peonies form more and better roots in light rather than heavy soil.

Where the soil is sandy, an addition of clay would doubtless be an advantage. In a heavy clay, which is the condition in my garden, a free use of sifted coal ashes and leaf mold, dug into the soil, works wonders in ameliorating and improving its tilth. Coal ashes contain little potash, and add practically nothing of chemical fertilising ingredients to the soil, and nearly the same may be said of leaf mold, but both improve its mechanical condition, which is of the very first importance for successful plant growth. Sand and road scrapings, where available, are, of course, excellent for lightening heavy soil; stress is laid on coal ashes simply because their value is not usually appreciated, and in small gardens it is a convenient, available material, usually a waste product to be gotten rid of. My attention was called to the value of coal ashes by Dr. Henry P. Walcott, who has used it for many years in his garden. It is much used by English and Scotch gardeners for clay soil. In the autumn cleaning of the streets in Cambridge the city carts collect great quantities of leaves, which they are very glad to dump on the grounds of willing citizens. These, in a single year, by turning once, make a fine, well decomposed leaf mold, ready to dig into the garden, and give room for a new lot of leaves.

Time to Plant.

It is emphatically best to plant peonies in the Fall. In the Spring they may be transplanted, if necessary; but it is undesirable to purchase stock at that time. Frequently plants purchased in spring will not appear above ground the first year, as may happen with excellent stock coming from a distance; also in spring there is more chance of the death of some plants than with fall planting. If plants are received in autumn too late for fall planting, as is sometimes the case in importing, or if they are in questionable condition, if small enough, it is best to pot them and plunge the pots in a cold frame for the winter. In spring they can then be planted out without disturbing what roots they have made.

Peonies may be left in the ground without transplanting some eight or ten years, but longer is undesirable if best results are to be attained. It is sometimes stated that peonies may be left in the ground almost indefinitely, but this is a mistake if good results are expected. The finest flowers are to be had on moderate-sized, well-grown plants. If plants are left too long in the ground they sometimes die out in the centre.

Propagation.

For purposes of propagation, plants may be advantageously taken up more frequently, every two or three years, divided with a large, sharp knife (a small carving knife is very good), so as to leave at least one bud with a portion of the root. Peony roots are stiff and unyielding, as well as brittle, so that they are very apt to be broken seriously in dividing. Harrison says: "Let them lie in the shade a few hours and wilt. This toughens them and does not hurt them a particle. You can immediately restore them to their plumpness by putting them in wet moss, or keeping in or planting in moist earth. This is very important." I have tried Harrison's method, only I left them out of ground for several days in cool weather. When the roots become somewhat flaccid and yielding, instead of rigid and brittle, they can then be easily divided without injury, even to solid old clumps. They will regain their original plumpness in a few hours' exposure in a damp medium.

The small plants, after division, may be set out in nursery rows, 2 ft. apart, the plants being about 10 to 15 in. apart in the row, according to size. In cutting up, some roots will be broken off, and these may be planted with the rest, as more or less will grow from adventitious buds starting under these conditions. Actual observations of what proportion will grow from adventitious buds would be desirable, but do not exist, as far as I am aware. In propagating, if the plants are choice and are cut very fine, it is desirable to set a frame over them the first winter. As Peterson says, herbaceous peonies of choice varieties may be propagated by grafting. This method is practised to some extent; but I think is most undesirable for herbaceous plants. Grafting is not expected in such plants, and, if practised, endless confusion in varieties may occur from the growth of adventitious buds from the stock. If this is done they should be grafted on officianalis stock, or some other distinct species, so that shoots from the stock, which are likely to develop, will be strikingly distinct from those developed by the scion.

F. L. Temple in 1889 suggested the method of propagating herbaceous peonies by heaping up fine, rich soil over the crowns; under such conditions he found, by an accidental experiment, that roots and buds developyed on the stems, which could then be cut off, leaving the crown intact. Timme, in a recent paper, recommends this method of deep burial as a means of propagation. According to him, the procedure is as follows: In spring, before there is any growth above ground, a bottomless box or tub is placed over the plant and filled with nice porous soil to a depth of 12 to 15 in. The new growth will push through this layer of earth, developing its foliage and flowers above it. By keeping this soil enclosed in the box fairly moist all summer it will be filled with roots about October. The stalks are carefully cut away below the new stratum of soil, and cut into as many pieces as there are eyes provided with roots. These short lengths, planted to a depth of about 2 in. below the surface, will grow into fine stock in less time than will small root divisions. Timme says that this sort of layering succeeds well with nearly all herbaceous peonies.

Mallett, in England, also recommends this method of propagation, as he says " . . . cover the stools with 8 in. of light soil made firm; growths will push through this in spring readily enough, and will flower well, but in September the resting buds will be found on independent stems 6 in. long, and with a mass of roots at their bases. These should be detached and planted forthwith, and the old soil cleared from the stools to admit warmth, when they will develop many buds hitherto latent, and which they always have in reserve. These will flower in the course of the season. . . . The flowering strength of the stools is but little impaired, but a vigorous thinning of several weakly growths may be necessary in the second season." "Strong double peonies will often form three or four resting buds on one rooting axis. These may be removed individually with a portion of the stem and its roots attached, potted, and grown on in a little warmth till planting time to encourage further root action." If this method proves as satisfactory as has been expressed, it may well be a most important means of propagating peonies. As Temple suggested, it would probably be best to fill in the earth gradually rather than the whole depth at the start; but this is a matter for determination. Leaf mold being fine, light, and retentive of moisture would, it seems, be good material for covering.

Starting New Beds and Transplanting.

In starting new beds or plantations it is important to plant peonies where they have not been grown for at least two or three years, as bits of roots are practically certain to have been overlooked in digging up the plants, and such growing make confusion with varieties. Of course, any given variety can be replanted in the same situation without risk of mixtures.

Peonies may be transplanted or dug up for division to best advantage late in February or in March, rather than in April or May, as the roots then have a chance to become established before cold weather. The crowns may be set about 3 in. below the surface; deeper planting is undesirable. For permanent planting peonies should be set 3 ft. apart, or, if there is plenty of room, 4 ft. is none too much. If set closer it will be difficult to get between the plants without injuring the blossoms. If plants are small when set out interspaces may be utilised for gladioli or any plants that will not cast appreciable shade or otherwise interfere with the peonies. Such plants had best be annuals, or of an annual character, as perennials would interfere with a free cultivation of the soil. In digging use a fork, not a spade, as less injurious to the roots of the peonies.

How to Plant.

For a limited number of peonies scattered planting is desirable, as allowing for the full development of each individual plant without loss of space. When grown close together the blossoms during a heavy rain or wind are apt to be beaten down and entangled with the flowers and foliage of adjacent plants. Where considerable quantities are grown beds are doubtless best, thus having all together, a convenience in watering and other cultural treatment; also the effect of mass in a bed is very fine.

Plants should be set 3 ft. apart each way in a bed, or, better, 4 ft. between rows if there is room to spare. Never having had this luxury of space I can affirm that 3 ft. will do very well. Beds 6 or 9 ft. wide and of convenient length cut in grass and carrying two or three rows of peonies respectively are very attractive and easily gotten at for handling or inspection. Such beds are good for ros[illegible] ises, or vegetables, which may be grown in rotation with peonies when they have to be taken up. Beds of this character are used extensively in the Botanic Garden of Harvard University, in Cambridge, and also in the large garden of a skilful lady horticulturist in Newport, where very best results and effects are attained. Large square beds with grass paths are used by Dr. Charles Sedgwick Minot, of Readville, Mass., in a large part of his extensive collection of some 450 choice peonies, including 238 varieties. Such beds may be made of any convenient size, but beds for fifty or one hundred plants have certain advantages on account of the ease of keeping tract of such numbers.

Disbudding—Manuring.

A peony well grown, or the same variety grown poorly or with average culture are very different. Unless really well grown one does not know what are the possibilities of this fine flower. Disbudding distinctly improves the quality of remaining flowers, especially on the larger varieties. In some varieties, however, where profusion of bloom is a feature, they may be left to advantage. The lateral buds should be removed as soon as they are large enough to handle, so as to throw all the strength into the leading bud. Proximity to a hose is an important feature when possible in planning the position of a peony bed, for the free use of water in the growing season is a great aid in producing fine flowers. Liquid cow manure, or other liquid manure used during the growing season, promotes a splendid vigorous growth and correspondingly superior flowers. Water from a cesspool is excellent. Sheep manure or other fine manure stirred into the soil about the peonies in Spring works well, being washed down to the roots by rain or watering. In the late fall it is desirable to put 4 or 5 in. of barnyard manure above the crown of each plant. This may be done after the tops are cut off and the ground freezes hard; the manure being dug in in spring.

Delicate colored peonies lose their color more or less in strong sunshine, so that for very best results they may be shaded to advantage. By shading I have retained delicate shaded pinks in flowers, which were entirely lost in flowers of the same variety grown a few feet away, but not shaded. Of course, opening flowers in the house has the same effect as shading, saving the delicate colors, and some of the finest blooms one sees are flowers thus opened off the plant.

Cutting the Blooms.

Peonies have a great mass of petals, at least the double ones, so that when picked there is a large surface for loss of water. Such being the fact, it is important that they be put into water as quickly as possible after cutting. The best method is to carry a pail or can of water into the garden and put the flowers instantly into water, not even waiting to cut a second bloom. Experiment has demonstrated that flowers thus instantly put into water will outlast flowers kept even a few minutes without water. This is especially important for flowers that are to be exhibited, or shipped to a distance. When a peony is on the plant there is a continuous flow of sap to the flower. On cutting, this flow being shut off, from the suction thereby inaugurated it is quite probable that air particles are sucked in. If this is true, such air particles would tend to obstruct the vessels, interfering with the succeeding flow of water. If cut peonies are to be shipped they had best be kept ten or twelve hours in water in a cool place, when they become surcharged with water and travel vastly better than fresh-cut blooms. The same principles as regards cutting doubtless would apply to most other flowers as well.

Carnation Breeding.

By C. W. Ward,
before the Breeders' Association, at
Champaign, Ill.

The present carnation with which we are working is the product of several centuries of culture and hybridization. It is an open pollinated species, and mother plants can be used both from the hybrid plants as well as inbreeding upon the same plants, or upon the same variety. Once secured from seeds a variety is easily perpetuated by propagation from cuttings, which are secured in abundance and may be easily rooted. Improvements in varieties may be made by bud selection and bud variation due to hybridization. In raising varieties from hybridised seed very few important sorts are produced, the proportion being about one good variety for each one thousand hybrids grown.

Up to the present time I have been breeding for color alone, basing my work upon the theory that any laws developed in color work would hold good when applied to the development of other desired qualities.

The tools which I use in my work are very simple indeed, consisting of a pair of delicate tweezers and a microscopic magnifying glass. The method employed is to find the anther just bursting, so that the pollen is in a condition of dry powder. The anther is removed by means of the tweezers, and the pistil of the flower desired to be fertilised is lightly touched along its entire length by the pollen bearing anther.

In order to do my work with reasonable method, I have divided it into sections as follows: Crimson section, comprising crimsons or scarlet-maroon in color; dark pink section, which comprises all rose, cherry and deep pink tones; light pink section, which comprises the light salmon or Daybreak tints; scarlet section, which comprises all of the colors which may be termed red or scarlet; white section comprises tints; yellow section, yellow variegated only the creamy white and snow white with scarlet, crimson, or pink upon yellow grounds, as the yellow varieties are almost invariably marked with pink, scarlet, or some other tint; white variegated section comprises varieties of a light pink with scarlet or crimson markings. The blue section comprises varieties showing some tendency toward the blue in color. This latter section has not as yet produced anything that might be termed a blue, as invariably there is enough pink in the make up of the color to shade the tone into purple or mauve. The crimson, dark and light pink, scarlet and white sections have been fairly well fixed, but the yellow, white and pink variegated and blue sections will be very difficult to fix, as they are essentially mosaics, and there is a constant tendency towards variation in all hybrids produced from them.

The bulk of my profitable varieties can practically be traced to the variety General Maceo, which was the result of a cross between the English variety, Winter Cheer, and Mr. Dorner's American variety, Meteor. The original plant of Maceo had a very peculiar habit, being almost a climber, and was dug from the frozen ground after all supposed good sorts had been taken into the field, its only recommendation being an intensely colored large bloom on a plant having a habit somewhat resembling a creeping grape vine in growth, but by selection from bud variations, it was built into an immensely profitable commercial variety.

In hybridising carnations we sometimes meet with what is termed seed sports. These have been invariably light pink varieties (more or less marked with crimson edgings and stripes), that have been produced by crossing crimson sorts which had comparatively pure crimson pedigrees for several generations.

Aside from its commercial importance, there is a sentimental side to carnation growing. The production of new hybrids, which are distinct improvements upon existing sorts, is always a pleasure, and serves to keep one thoroughly interested in the Divine Flower, and amply repays for the close application necessary to produce practical improvements.

How I Commenced Carnation Culture.

Some fourteen years ago while walking down Broadway, in New York City, a Greek flower peddler pushed under my nose a bunch of clove-scented carnations. The delicious fragrance reminded me vividly of the old home garden with its little plots of Paisley pinks, and I became at once interested in the blooms. Being at that time out of business I took up the growing of carnations, believing that if chrysanthemums, roses, and other flowers could be improved by hybridization and culture, the carnation ought to respond to similar methods; and in this view later experience proved I was not at fault.

Commercial Importance of the Carnation.

At the present time the commercial value of the carnation grown in this country has risen so that the calling may be considered one of the substantial professions. The annual value of the carnation product reaches five to six millions of dollars when we consider both the sales of plants and flowers, and the capital invested possibly may amount to fifteen to twenty millions of dollars, taking into consideration the value of the real estate and buildings devoted to carnation culture.

The improvement in the carnation which has resulted in giving us flowers three times the size that they ordinarily were, with stems four to five times as long, has produced a general advance in the price of the carnation, which seems to keep pace with the increased demand. When I first undertook the growing of the carnation fifty cents to one and two dollars per dozen was considered the retail price. At present two, three, six, sometimes eight, and, in rare instances, ten dollars per dozen is secured. When I first entered the business fifty cents to one dollar up to four dollars per hundred as the maximum price were the wholesale rates. At present two, four, six, eight, ten to fifteen dollars are ruling prices, and at certain seasons as high as twenty-five dollars per hundred are secured for the best and most perfect blooms.

We have about two acres under glass devoted to carnation growing, the annual sales from which run from 30,000 to 36,000 dollars, netting a fair annual profit of 10,000 to 12,000 dollars.

Much has been said and written about the value of a single variety of new carnation. So far, I am informed, at least five varieties have been sold on a basis of 8,000 to 10,000 dollars per variety. One at least upon a basis of 20,000 dollars for the variety, this being the scarlet sort, Robert Craig, one of my own seedlings, a half-interest in which was sold last year for 10,000 dollars, and the Mrs. Lawson, which netted as much as the Robert Craig. The Robert Craig variety will not be disseminated until the season of 1906, and already orders have been entered for some 375,000 plants, which will probably be increased to 400,000 plants before the season of dissemination is closed.

Naming Carnations.

The naming of a new carnation is quite a puzzle to the originator, and he usually selects the name of some beautiful lady, some particular friend, some important personage, a bird, the names of planets, or something that will serve to describe or produce an impression on the characteristics of his flower. In naming my own productions, I have honored the varieties with such names as Governor Roosevelt, The President, Mrs. Roosevelt, Viola Allen, J. H. Manley, Robert Craig, and the Cuban patriots, General Maceo and General Gomez.

The Carnation in Politics.

The carnation has frequently been used in a political sense. It was the McKinley emblem and the campaign flower during the campaign which elected McKinley and Roosevelt, and during that campaign the various carnation growers throughout the country donated many thousands of flowers to decorate the buttonholes of those marching the political parades. At the present time the American Carnation Society decorates the grave of the lamented President McKinley with carnations each year on the 29th of January.

The carnation is extensively used as a decorative flower. It lends itself to almost every use in which flowers are suitable. Its varied and delicate colorings, its magnificent pungent refreshing odor, and its long keeping qualities render it probably the most valuable of all florists' flowers.

Degeneration of the Carnation.

This subject was discussed in a recent issue of "The Gardeners' Chronicle," London, England, by James Douglas, a carnation grower of about fifty years' experience. Mr. Douglas advances the following causes tending to degeneration in the divine flower: Over-propagation, over-feeding, which, he says, is a fertile source of disease; it also induces for the time a strong, sappy, but unwholesome growth, which can only be maintained for a few years. Over-flowering will also weaken carnations to a greater extent than many cultivators are aware. One large double carnation flower will reduce the vitality of the plant a greater extent than a dozen or a score of single flowers. The single bloom is of a very fugacious character; it rapidly develops, and in two or three days the petals drop off; whereas the large double flowers develop slowly, and last in full beauty for ten days or more, to the rapid exhaustion of the plant. The coloration of the foliage has a good deal to do with the vigor of the plant. The darker the green the greater is the vitality.

Mr. Douglas then suggests the following as a remedy for degeneration in the carnation: Selection of vigorous, healthy varieties both as seed and pollen bearers. There should be no great hurry to get up a stock of plants, but they should be propagated in a (more or less) natural manner. Over-stimulating manures should be avoided; the plants should be grown in good garden soil, using no stimulants but decayed farm-yard manure, which should not be allowed to come in contact with the roots. Some of the plants should have a year's rest from flowering, and layers [he is referring to the English method of propagation] should be taken from the rested plants. Wild plants do not degenerate, and if more natural conditions were allowed to prevail, cultivated carnations would be free from it.

We believe the views of Mr. Douglas, as expressed above, will find general endorsement by American carnationists. It is generally conceded that our "high pressure" method of cultivation is responsible in large part for varieties degenerating. The advice to return to more natural conditions is one worthy of attention and adoption.

In the same discussion, Mr. Douglas cites the late E. S. Dodwell, author of "The Carnation," as having stated that the average life of a variety of carnation was fifteen years. Few, if any, of the varieties cultivated in America can boast of such longevity; but that, we are inclined to think, is owing more to older varieties having been superseded in one or more of their attributes by their successors rather than to inherent defects resulting from senility. Fashions in flowers are also responsible for older sorts being discarded to make way for those that better meet the existing popular demand. It would prove interesting to know just how long a variety would live and thrive, under good conditions of culture, in the United States, before it actually petered out and became absolutely worthless.

Sweet Pea for Cutting.

:o:

To vast numbers of garden lovers the principal recommendation of the sweet pea lies in its unqualified value for the varied purposes of home decoration. It is essentially a flower for utilization in epergnes, vases, and other ornaments, while for dinner table decorations it is unrivalled. Among the worshippers at the shrine of this flower are many whose sole object in growing it is to have an inexhaustible supply of flowers for cutting, and it is especially for their benefit that the subjoined list has been compiled. It comprises new and old varieties, some of which rank among those recommendable for exhibition, that are extremely floriferous, and which, if persistently cut, continue to produce blooms over a very protracted period. The first and second named claim a place by reason of their rapid progress and early flowering propensities: Mont Blanc, Apple Blossom, Lady Mary Currie, Lady Grizel Hamilton, Dorothy Eckford, Firefly, Princess Beatrice, Dorothy Tennant, Gracie Greenwood, Prima Donna, Blanche Ferry, Emily Henderson, Miss Willmott, Duke of Westminster, Countess Cadogan, Prince of Wales, Queen Victoria, Lottie Eckford, Prince Edward of York, Countess of Lathom.—"Sweet Pea Annual," 1905.

Classification of Sweet Peas.

In 1902 the National Sweet Pea Society (England) organised the first public attempt to classify sweet peass under recognised color headings, and diverse as are the opinions held in regard to colors, the result, as judged by the expressions of numbers of growers, was an unqualified success. The tabulated returns were quoted on every hand, appreciations coming from America as well as from all over the United Kingdom. Seed merchants expressed theinr approbation and were anxious that something of the same nature should be done every year. It was, therefore, decided to conduct a second classification during 1904, and the results are subjoined.

A close perusal of the details, particularly if the original classification is used for comparison, will show remarkable evidences of stability and equally remarkable fluctuations. Several varieties that held prominent positions in 1902 are just as conspicuous now; while others have fallen substantially from their erstwhile high estate. Then, too, some that received only a comparatively small number of votes in the earlier work have now risen considerably in public esteem. Those only have been included which received upwards of ten votes in the forty papers filled in—every one below that standard has been excluded, so that those retained may be regarded as the finest sweet peas in general cultivation. There are several others of the finest quality which are not yet, owing to comparatively recent introduction, very widely grown.

White—Dorothy Eckford, Blanche Burpee, Sadie Burpee, Emily Henderson, Mont Blanc (for early flowering).

Crimson and Scarlet—King Edward VII., Salopian, Scarlet Gem, Mars.

Cerise—Coccinea.

Rose and Carmine—Prince of Wales, Lord Rosebery, Mrs. Dugdale, Her Majesty, Lord Kenyon, Royal Rose.

Pink Shades—Prima Donna, Countess Spencer, Lovely, The Hon. F/ Bouverie, Mrs. Knights-Smith, Countess of Lathom.

Blush—Duchess of Sutherland, Sensation, Countess of Aberdeen.

Blue—Navy Blue, Countess Cadogan, Emily Eckford, Captain of the Blues.

Yellow and Buff Shades—Hon. Mrs. E. Kenyon, Lady Mary Ormesby-Gore, Mrs. Eckford, Queen Victoria, Venus.

Orange Shades—Miss Willmott, Gorgeous, Lady Mary Currie, Chancellor.

Lavender—Lady Grizel Hamilton, Countess of Radnor, Lady Nina Balfour.

Mauve—Mrs. Walter Wright, Dorothy Tennant, Admiration, Fascination.

Violet and Purple—Duke of Westminster, Duke of Sutherland, Duke of Clarence.

Magenta—George Gordon, Captivation, Calypso.

Maroon and Bronze—Black Knight, Othello, Shahzada.

Picotee Edged—Dainty, Lottie Eckford, Maid of Honour, Golden Gate.

Striped and Flaked (Red and Rose)—America, Aurora, Jessie Cuthbertson, Mrs. Joseph Chamberlain, Pink Friar, Gaiety.

Striped and Flaked (Purple and Blue)—Princess of Wales, Senator, Grey Friar, Wawona.

Bicolors—Jeannie Gordon, Triumph, Prince Edward of York, Blanche Ferry, Little Dorrit.

Fancies (those with more than two distinct shades)—Gracie Greenwood, Agnes Johnston, Lottie Hutchins, Duchess of Westminster, Stella Morse.

For the purposes of this classification, and for future exhibitions, the Committee of the National Sweet Pea Society has decided to regard the following varieties which are bracketed as synonymous.

Duchess of Sutherland
Modesty
Countess of Radnor
New Countess
Flora Norton
Memento
Blanche Ferry
Earliest of All
Dorothy Eckford
White Swan
Mrs. Geo. Higginson, Jr.
Gladys Deal

—"Sweet Pea Annual," 1905.

Lasting Qualifications of Cut Flowers.

In various classes of plants there may be some difference in regard to the time cut blooms will last, but in many instances it is more imaginary than real, and it is a little difficult to find the cause of some going off quickly, while others last well. Yet, in some cases, the cause is quite apparent. The first thing is that they should be cut before, or as soon as, they are fully expanded. I have seen several examples in the market this season, where, from the swollen capsules, it was quite evident that the flowers were almost passed before they were cut, and a day longer would see them quite done for. We know that in some cases it may be an advantage to hold flowers over for a certain period, but in the long run it will pay better to cut as soon as ready and they will give much better satisfaction to the customers.

I find in carnations, any which seed freely do not keep so well as those which are abortive; for as soon as fertilization takes place the petals wither away. This was one quality with the old favorite Miss Joliffe, it never, as far as I am aware, produced seed, and consequently the flower lasted well, and this is a point worth studying by growers generally, for there is no doubt but that it is the main cause why some last better than others. The Marguerite carnations are pretty, but unless they are cut before they are fully developed they go off quickly. It may be that the petals are not of great substance, but the chief cause will be found in the fact that they seed so freely. Begonia Gloire de Lorraine is a good example of an abortive flower lasting well. It is the one advantage in double flowers, that, being seedless, they last so much longer. The advantage of dipping the stems in water as soon as they are cut is often overlooked. Most market growers make a great point of this. Dipped in water (the stems only) and shut up in a close box, they keep fresh even longer than they would if put into water after the stems have got a little dried. Any that are inclined to bleed from the flower stems will keep much better if dipped in hot water. The practice of immersing the flowers in water is not a good one; with few exceptions, flowers last much better if kept quite dry, and some are absolutely spoiled by being wetted. The sweet sultan (Centaurea suaveolens) is an example of this, and it will last almost equally well without even the stems being in water. In some flowers, foliage left on the stems will absorb all moisture, and cause the flowers to fade quickly; this is the one disadvantage with chrysanthemums on long stems. But to get over this, exhibitors often strip off all the leaves from the flower stem, and use another stem with leaves only. I believe there are many who do not recognise the disadvantage of leaving the foliage on, for one often sees them in the market with all the foliage intact.—METROPOLITAN, in "Horticultural Advertiser," England.

The Making of a Lawn.

Florists are often called upon to superintend the laying out and making of home grounds. The trees and shrubs should be planted before anything else is attempted. The lawns and walks would be the next work to undertake. If the gardener could always have his own way he would plant trees and shrubs early in spring, lay out the drives and walks in the fall, and work up the soil for the lawn so as to have it ready for sowing the following spring. To get a good lawn the first year is only possible if the ground is covered with selected living sod, which is the most expensive way of making a lawn; but if good grass sod is obtainable and within handy hauling distance, and if good sodders can be set to work at reasonable wages, contract work of this kind pays handsomely. The sod should not be any thicker than an inch, only thick enough so that it holds and does not tear in handling. The surface of the soil must be in fine shape and perfectly even, and if the sod is also of an even thickness a large surface is quickly covered. After the sod is down a rolling or pounding is in order, and, after this, should the weather be dry, a thorough watering and the job is done.

Fully as good a lawn can be made by sowing the grass seed. Sowing the seed very thickly so that all the ground looks white, will cause a dense growth of young grass to come up. It may please the owner and may appear like a good lawn, but it is not. Good lawn grass seed goes a good ways, and must not be scattered too thickly, and in one year or two a lawn started with the young plants at proper distances will be a finer sight than the one started with a dense growth of newly sown grass. The grass seed must be carefully raked in and then rolled several times, unless it is wet weather, when the rolling must be deferred until the lawn is dry again. The best success with lawn grass seed will be had if the sowing can take place in October. If much earlier the young grass, although believed to be hardy, is apt to succumb to late heavy frosts, and if sown much later our hot and dry summer days will give it no chance to thicken and spread, the roots being too short to derive sustenance from a cool and moist subsoil. Any amount of watering will not save an open, exposed, late-made lawn. Weeds will flourish and the grass will die out.

Why some people can have a fine, velvety, spotless lawn when others, in spite of often repeated sowings and continual drenching with hose and sprinkler, cannot call forth a decent spot of the coveted green, is easily explained. The former took the utmost pains in preparing the ground for their future lawns, while the latter covered a pile of rubbish, tin clippings from the roof, old paint cans, the carpenter's sweepings, and the yellow and blue clay from the basement excavations, with an inch of black soil, expecting that grass, of course, will grow anywhere. But that is a great mistake only too often made even by people who would not mind the expense entailed in the proper preparation of the lawn had they only known better. An evergreen, fine lawn for many years to come is secured by working up the soil to a great depth, placing the lifeless clay away down into the trench if it cannot otherwise be disposed of by adding large quantities of rich manure to the soil and by sowing the seed in April.

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The Orchard.

OPERATIONS FOR AUGUST.

Prepare ground at once for planting lemon and orange trees. Manure must be used liberally, or no good results must be expected. As a rule the ground should be trenched two feet deep and the manure worked evenly down from top to bottom, as it is a serious mistake to throw it into the trenches in masses. Care must also be taken to provide free drainage when planting in low situations, because a stagnation of water at the roots is disastrous to these trees, although a liberal supply of water must be provided to carry them through the months of January to April. After trenching, the ground should be left a week or two to consolidate, so that it may be in a good, firm condition by the middle of September, when the trees may be planted, Young orange trees should be manured and forked round, and afterwards mulched with a good coat of half-decayed stable manure. Older trees will now be in full bearing, and it is difficult to cultivate amongst them until the crop is removed, but as the fruit from each tree is gathered no time must be lost in manuring the trees and forking amongst the roots. Scale sometimes attacks the trees in a serious manner, but this is readily destroyed by spraying once or twice with soapy water in which a little kerosine has been mixed. Two ounces of soap dissolved in a gallon of water and a gill of the oil, kept well stirred, will generally cleanse the trees at the second application.

Now is a good time to manure amongst apricots, peaches and nectarines. Well-decayed stable manure is the best fertillser for these trees, but bonedust may be substituted where no lime exists in the soil. Loquat trees may be planted. The ground should be trenched and well manured, and they should be planted in quarters by themselves rather than be mixed up with other kinds of fruits; old trees should be well pruned, severely thinning out the branches and twigs, if superior fruit is desired. Loquat stones may be sown in nursery beds.

(Notes by W, J, Allen.)

GRAFTING AND BUDDING

The latter part of this month is a good time to start the grafting of deciduous nursery stock, and should there be any unprofitable apple, pear, or other trees standing in the orchard, these also may be grafted to good varieties. Grapevines are easily grafted just as the buds are well swollen and about to burst. Old peach, plum, and apricot trees will be found much harder to graft than either apple or pear trees. If, however, there are any such in the orchard which are unprofitable, it would be as well to cut them back and graft to better varieties, and in the event of the grafts not taking, young shoots might be allowed to grow and buds inserted either in the summer or fall.

SPRAYING

Besides the above work there is the winter spraying with the salt sulphur, and lime solution, which will kill two birds with one stone, being both an insecticide and a fungicide. It answers fairly well in keeping in check the curl leaf of the peach tree, but for this latter disease Bordeaux mixture is even better. Trees treated with either of these solutions will show very little curl.

SAN JOSE SCALE

The lime, suphur and salt is one of the best sprays we have for San Jose scale, ut where trees are badly infested it is best to give two sprayings, one in the fall and another in the spring, just as the leaf buds begin to swell and the trees are in blosm.

APHIS

For peach aphis the resin and soda is a good useful spray, as is also the blue oil emulsion, but it usually takes several applications to keep this pest in check.

At time of pruning, particularly in young orchards, a sharp lookout should be kept for the appearance of woolly aphis, and should any trees be found infested, they should be carefully pruned, removing and burning as many of the infested twigs as possible. Then either scrub the trees thoroughly wi h a strong kerosene emulsion, or fumigate with hydrocyanic acid gas, so as to eradicate this pest if posaible.

CODLIN MOTH

All old bark should be scraped from apple, pear and quince trees, and the scrapings burnt, and every thing in the orchard which is a harbor for codlin moth must be destroyed.

In Tasmania the moth has been kept in hand by repeated sprayings with Paris green, and in South Australia the arsenite of soda spray has given good results. This latter spray is prepared as follows—1 lb of best arsenic and 2 lb of washing soda boiled in 1 gallon of water for about three-quarters of an hour or until the mixture is clear. Then add a pint of the stock solut on to 40 gallons of water to which has already been added from 6 to 8 lb of best freshly-slaked lime; if this latter precaution is neglected, the result will be that the spray will seriously burn the foliage. Some varieties of apple-trees are much more tender than others: for these use the larger quantity of lime, The arsenic is much cheaper than Paris Green, and when bought in quantities should not cost more than about one-third as much per lb.

For this State I am of opinion that at least four sprayings will be necessary to keep the moth in check. At the Bathurst orchard this year we have used the arsenite of soda and several other mixtures for combating the codlin moth, with excellent results. We picked at least 90 per cent of clean fruit.

CLEAN FRUIT HOUSES

Keep all fruit houses as clean as possible, as there is no doubt that they are responsible for harboring a great many moths every year; therefore keep the rooms as air tight as possible. and as soon as the moths begin to hatch in the spring, burn sulphur fumes in the rooms once every other day for a fortnight, so that the moths may be destroyed as they begin to fly.

VINES

In working around vines keep a sharp look out for the pupæ of the vine moth. If there are any old partially rotted, stakes, the moths will be found adhering to these, and also under the old bark which is hanging to the vine. Crush these wherever found, and thus assist in keeping down this pest as far as possible.

Growers who intend using quick-acting fertilisers should make the first application this month. It is best not to apply too much at one time, but rather make two applications—one now, and one after the fruit is well set.

W. H. COATS & SON,

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And Wholesale Exporters

East End Market . . . Adelaide.

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Particulars of rates for display advertisements and contracts for three, six, nine and twelve months will be supplied on application.

Vegetable Garden

OPERATIONS FOR AUGUST.

The most important work here will be the preparing of ground for summer cropping. First comes manuring, and as the manure for all summer crops must be immediately available as plant food, all partly-decayed stuff should be avoided, using only well-rotted farmyard or stable manure. It is hardly possible to use too much of this, so long as the supply of water is plentiful during hot weather, but it should be remembered that the lighter the texture of the soil so much more quickly does it part with moisture, and large quantities of manure tend to render the soil lighter or more porous. At the same time, large quantities of manure and water give enormous crops. For summer crops the soil should be worked deeply to secure the best results. When the roots of the plants can penetrate the subsoil, not nearly so much watering is necessary to keep them in a fresh condition, as the evaporation from a depth is very slow in comparison to that from the surface of the soil. The importance to summer crops of deep working is illustrated by the fact that vegetable marrow roots penetrate to a depth of 18 inches, and ramify the soil to a distance of 10 ft from the caudex; and cucumbers and melons root proportionately.

(Notes by W. S. Campbell.)

Every effort should be made to get things ready for the sowing and planting of spring vegetables, and for the planting of evergreens in the flower garden for shrubbery; for, although the best time of year for planting them is during early autumn, with care and attention they will probably succeed satisfactorily if planted before hot weather sets in.

ASPARAGUS.

It would be desirable for those who intend to plant asparagus, to prepare some land as soon as possible, for they can plant in August or early in September, and it is no use leaving the preparation of the ground until the last moment. If the growing of vegetables does nothing else it trains, or has a tendency to train the grower to look ahead, and this is a very necessary matter for anyone who strives to make a living from the soil. Asparagus is a vegetable which gives but little trouble after it is once planted. At the present time of year the haulm should be all cleared away, the soil between the rows cleaned and forked up, and a dressing of manure spread over the bed as a sort of protection during the very cold weather; but in many districts such protection is unnecessary. The manure may be forked in just before spring, and the stools begin to start with growth.

ARTICHOKE, GLOBE.

The best time to plant either suckers or young plants is early in the spring, when they will start into growth soon after planting. If planted now they will probably remain dormant, and perhaps some of the suckers may die off. One or two plants is likely to suffice for an ordinary family

ARTICHOKE, JERUSALEM.

May be planted during the month in any convenient place. This vegetable is well worth growing, and will be found a useful substitute for the potato where that vegetable does not happen to succeed satisfactorily. Plant in rows 3 or 4 feet apart, 4 or 5 inches deep, and 12 inches or so apart in the rows. A little practice will soon show how far apart various kinds of vegetable seeds or tubers should be planted, for this will depend in a great measure on the quality and condition of soil. The distances given in these directions are simply for a guide, and need not be followed implicitly.

BEANS, BROAD.

A few seed may be sown in the beginning of the month, but after that, except in the cool climate districts, it will be rather risky to sow.

BEANS, FRENCH

In the warm districts along the coast seeds may be sown towards the end of the month; but whenever there is a possibility of a visitation of frost, a sowing had better not be risked.

BROCCOLI.

Sow a very little seed occasionally in order to keep up a supply of seedlings to plant. Any plants already to hand and sufficiently advanced may be planted. The soil should be in good heart, or the broccoli is not likely to succeed as well as it should.

CABBAGE.

Sow a few seeds from time to time and make a trial of different kinds, such as Succession, Phenomenal, Lamb's Earliest of All, St. John's Day, Early York, Sugar-loaf, Express, Savoy, and Red Cabbage, or any other varieties obtainable.

CAULIFLOWER

Treat in just the same way as has been recommended for the broccoli.

CARROT.

Sow a few rows now and then during the month, and try some of the short, medium, and large grown kinds, such as the Early French Forcing, Early Short Horn, James' Scarlet Intermediate, and others.

CORN SALAD OR LAMB'S LETTUCE

might be tried, for it is appreciated by some persons, although not at all by others, as a change. It is a different thing altogether from the lettuce, being a Valerian, species locusta. Sow in drills, and cover the seed very lightly.

CUCUMBER

Those interested in raising early cucumbers can raise seed under a glass frame in a warm place, or on a hot-bed if one has beem made. The seedling can be planted out next month, but must be protected from late frosts.

LEEK.

A little seed may be sown once or twice during the month, and any well advanced seedlings planted out in shallow trenches.

LETTUCE

There should be a sufficient stock of advanced lettuce to plant out, and others coming on. Plant out all that are large enough, and take care that the soil is in good condition and well manured. Transplanting may be carried on well into the spring, but after that, it is better to sow seed in drills where the lettuces are to grow, and then they are not so much inclined to run to seed without hearting.

ONION

Transplant young onions that have been raised in a seed-bed for the purpose, but before planting manure the ground heavily and mix the manure well with the soil. The more rotted the manure, the better it will be for the onions Avoid planting on low-lying land liable to become over wet after heavy rains.

POTATO

Plant a row or two during the month, in warm disiricts.

PARSNIP

A little seed may be sown where land has been well prepared, The parsnip needs a deep soil, and will succeed best where the ground has been trenched,

PEAS

Sow during the month, from time to time, as extensively as may be required, for peas should grow well at this time of the year if the season is at all favorable. The rows should be from 3 to 4 feet or more apart. Plant the pea about 3 inches deep, and about 4 inches apart

SAVOY

Sow a little seed and treat it as you would the cabbage, using plenty of manure.

SPINACH.

Sow a little seed now and then during the month to keep up a supply if required, in drills 2 feet apart, and thin out the seedlings when they come up to about 1 foot from plant to plant.

SWEDE

Sow a little seed in drills occasionally.

TOMATO

Raise in a warm protected place a few plants if cuttings of last year's plants are not rooted The seedlings will need protection from frosts where they are likely to occur.

TURNIP

Sow a little seed in drills.

—Agricultural Gazette, N,S,W.

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THE POULTRY YARD.

Clippings from "The Australian Hen."

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How to Begin.

A Word to Beginners.

By E. D. O'DONNELL.

The first thing the beginner in poultry farming has to do is in the language of military men to determine his objective. In other words, he should carefully think out and definitely decide upon the line along which he is to proceed and the end he desires to reach.

There are three courses open to him—

1. To raise stock for show and stud purposes only.

2. To raise birds and eggs for the market only.

3. To combine both the aforesaid lines; each of these lines has its own characteristics, and calls for certain qualifications if success is to be won.

1. To breed for stud and show purposes only. The beginner must, is he is to succeed, recognise certain facts. In the first place he must be a good judge of stock himself, in order to be allowed to select his birds when starting, and also be able to select the quality of his young stock when he breeds them. We would strongly advise the beginner, if he be not an excellent judge himself, to get some reliable authority to select the birds for him. Another essential is a good amount of capital. It is simple folly to try to breed for stud and show purposes, with anything but the best stock, if only for the reason that one handicaps himself from the start with those breeders who are already in that line. For the best birds you must pay the best price. Then again, it must be remembered that in this branch of the poultry industry there are usually far more blanks than prizes. Happy is that breeder who can secure 25 per cent of prize birds from his year's work. Again, it must be also remembered, that in this section of the field the competition is pretty keen, and the constituency to which you appeal is necessarily limited.

2. To raise eggs and stock for market purposes only. To start in this line you need far less capital than in the branch referred to, for the reason that you can purchase birds of good utility quality without much reference to their feathers, and get them cheap. But we strongly advise that from the start none but pure bred birds shall be kept, and let it be from proved and tested laying and flesh-producing strains. The advantage of this branch of the industry is that you are sure of a market for your produce, and with the exercise of a little skill in breeding winter layers of a very fair and regular income. Of course, to secure a good living out of it you will need a large flock, and the larger the flock the greater the profit. The most successful operator along these lines of whom we have any knowledge is Mr Ellis, of Botany, N.S.W.

3. To combine the aforesaid lines, that is to say, let your breeding pens contain only pure bred birds, and from them draft out every year a large flock of pullets to lay eggs for the market. The advantages of this system are many. In the first place you will have a regular supply of market eggs, which means a steady source of income. Then you will have quite a number of cockerels to send to market to pay for the cost of their own rearing and that of the pullets. In addition to this, you will have a considerable source of revenue in eggs for hatching and birds for breeding. We are more than ever convinced that it is along this line that the truest success in the poultry industry is so be found.

And now a word of Caution—

The vital point in this connection is the selection of your breeding stock. A mistake here will be fatal to your whole business.

The key word to the whole situation is Utility, Utility, Utility. Success in the pen is no criterion of profit in the egg basket.

Rub it into your memory until you cannot forget it—that egg production is more a matter of strain than breed

The fact that Mr X's Silver Wyandottes lay well is not a criterion that Mr Z's will do the same.

Because the White Leghorns owned by Mr B lay 200 eggs a year it does not follow that Mr C's will reach that mark. A careful study of the Laying Competitions will satisfy you on this point. The breed that heads the list is not unfrequently also at the bottom of the poll. From this we conclude that in egg production we must recognise the law of the survival of the fittest and only breed from proved laying strains.

What to do.

Get busy.
Be up-to-date.
Don't grumble,
Buy fresh blood now.
First come first served.
Kill off all the weaklings.
Never sell your best birds.
The thorough-bred is a winner.
The best obtainable is not too good.

Upwards of ten thousand pounds worth of poultry and eggs were produced in Great Britain last year.

Yet nearly twenty million dozen eggs had to be imported into that country.

Seems as if there is a market for all our produce there, if we can only land it in good condition at a profit.

A few years ago the poultry industry was regarded as a little thing by most people.

Now, however, it is generally acknowledged that the lay of the humble hens is a startier.

Not only eggs, but marvellous accumulations of figures are produced by the little workers.

Provide every pen with a dust bath. Remember this is as essential as your own shower or plunge.

'Every hen her own dentist' is a true bill, but the poultryman has to provide the false teeth.

The hen, however, will see to the fitting, and there will be no expensive fillings, or gold 'crowns' and plates.

Ever invite your fowls into the shade to have a drink?

Cool water costs little, and 'shouting' for the hens is not an expensive undertaking.

The scalding of the drinking vessels is very essential. Better wash-up with poultry same as in the home.

Don't have the roosts so high that imaginative hens believe they are doing a parachute decent every morning they fly down.

Marvellous what a lot of sport you can get out of poultry raising, properly conducted.

Marvellous what a lot of money you can drop breeding fowls for profit on a no-experience mismagement basis.

It is impossible to exercisee too much care in the selection and purchase of breeding stock.

Constant culling of unproductive birds and breeding from known layers only, will soon result in the establishing of a good laying strain.

H. V. Hawkins, in the Victorian Journal of Agriculture, gives the following excellent system of keeping the houses clean:

"The continual cleaning of the floor is followed by the ground becoming based shaped, and the result is a damp floor in winter time. A cheap and effective plan to prevent this is to purchase a piece of black tarpaulin, almost the size of the floor, nail this on two pieces of wood, one at each end, and place on the floor of house. Every morning roll this up and empty the droppings into a wheelbarrow. If the birds have been scouring through eating too much wet grass and the carpet of tarpaulin has become dirty, remove it to a tap and put the hose on. It is advisable to throw a litrle sand on to prevent the droppings from adhering to the tarpaulin. This system works well, and saves a great deal of time, and prevents the spread of vermin.'

Hear, hear! This is a novel method and as good as it is novel.

How and What to Feed.

:o:

Be clean.
And punctual.
And particular.
And be systematic.
Diversity is an essential.
Feed all mash in a warm state.
Make them scratch for all the grain.
Cheap food is sometimes wonderfully dear.
Never feed smutty, burned or dirty grain.

The man who doesn't exert himself about feding won't have to do so in the collection of eggs.

Commercial Poultry says green bone should be fed three times a week to the hens and daily to the male.

Do not forget that animal food of some kind is absolutely neeessary for best results in eggs and fertility in the winter.

A farmer stated that half the breed is in what goes down their throats.

A rather crude method of expression, but a trite saying without a doubt.

Poultry (says an exchange) should be fed at regular times for several reasons. A flock soon learns its feeding time if it is fed at the same time every day, and between meals is contented and quiet. If they are fed whenever the keeper happens to think about it they are always looking for food, and when he comes in sight they make a rush for him, expecting something to eat, while one that is fed regularly pays but little attention to their keeper if he happens to visit the yard between meals. If a flock is allowed to run at large and is fed only at regular times, the fowls will wander away and stay out of range during the day, except at meal times, while if regular feeding is not practised, every time the keeper appears the fowls will be seen tt come hurrying to the feeding place. It is especially important that fowls kept on limited runs or small yards should be taught to look for food only at regular hours. If this is not done they will spend most of their time looking through the fence, expecting someone to come along and feed them. Regularity means money to the poultry-keeper as to other business men.

Because a person has the chicken fever it is no reason why the fowls should be made to suffer with him because of poor quarters and improper care.

Subscribe to "The Australian Hen." Price 3d.—Harris & Son, Sydney.

Will some judge rise up amongst us, and let the public see which are the true Runners and which are not?

Disease Prevention and Cure.

:o:

Roup,
Colds,
Dysentery,
And Warts
Are prevalent
More so than ever.
They should not be.
Want of cleanliness, mostly.
Want of thought to a great extent.
Prevalence of mites are also a factor.
There is no remedy for carelessness but reform

The foundation of health is strong, healthy breeding stock.

Do not let the lice and mites get ahead.

Prepare to fight them now.

It is a good deal easier to get rid of a hundred lice than a million.

Get to work right away and get rid of tnem before their breedng season arrives.

Unless they are banished before the chicks begin to arrive it will be a hopeless fight.

Take time by the forelock (says Commercial Poultry) instead of by the fetlock.

One of the best tonics is a few drops of tincture of iron in the drinking water.

Burn or bury deep the carcases of all fowls that die from disease of any kind.

Do not allow them to lay about where they can bring contagion to the whole flock.

What about a good whitewashing campaign before the busy season is on to you?

If one of the breeding birds gets a bad attack of disease, it is a good one to leave out of the pen.

Too much salt means sudden death, but that is no zeason why the fowls should not have any.

A pile of rubbish in the pen is simply a breeding place for insects, vermin and disease germs.

Bowel trouble comes from colds, improper feeding, and the ravages of lice, mite and ticks.

Digging up the runs occasionally not only freshens them and clears away disease, but supplies a certain amount of food to the birds as well.

They say (says the Poultry Review) a will eat more filth than even a pig if she has the chance. Do not give her the chance.

GRIFFITHS BROS.

TEAS

SATISFY

49 Rundle St., Adelalde,

... AND AT ...

MELBOURNE and SYDNEY.

The new address of the "Australian Gardener" —The corner of James Place and Grenfell street, City.

Indian Runner Ducks.

:o:

Mr Walker, of Toronto, N.S.W., now gives the full twelve months record of his four Indian Runner ducks. These birds for the year ending May laid 986 eggs, an average of 246·5 each, and are still laying.

If the Indian Runner is to retain its great and deserved popularitv, there will have to be a decided change either in the methon of judging or the judges themselves, as at present, awards are going to birds that cannot be really Runners at all, and that would but poorly represent the breed in the matter of egg production also.

Unfortunately, unscrupulous persons in the early days of the Runner boom introduced all sorts of foreign blood into their Runner flocks, and as a consequence stock were sent broadcast as Runners that were in reality nothing but mongrels.

As a consequence many people who considered their birds first-class were merely deceiving themselves and getting a decidedly false impression of Runner characteristics. This trouble, however, is being overdone, and it is safe to say that nine out of ten of the elder breeders are unanimous as to what constitutes a first-class Runner of either sex, and are breediyg for this ideal. The trouble now is the selection of judges. Indian Runners now constitute one of the biggest classes at some of our shows, anh as much care should be exercised in the selection of a judge as for any other secsion. Yet what do we see? The judge for Runners is generally a man who bred ducks, and is not competent to judge the more popular varieties of poultry and has all the ducks allotted to him in andition to such poultry classes as Houdons, Cochins, Brahamas, and others that average about 1½ entries per class. Or to put it plainly, Runners are usually judged by the official with the smallest reputation, as a judge, in the entire show.

Is it any wonder, then, that we see birds that would pass for very fair Rouens awarded first cards as Runners by judges who go by size alone—birds with black heads, with green sheen and breasts as deeply imbued with claret as a French toper's nose. Is it any wonder we see birds of Aylesbury, Pekin and Muscovy type and build, scoring time after time.

Will the judges selected to pass an opinion on this breed study tbeir standard or refuse to act? Will they remember the long, wedge-shaped head; the long, thin neck; the long, slim body and upright bearing?

Will they remember that the color of the featbers (apart from the white) should be as even as possible throughout, except the tail of the drake, which is darker? Will they remember that a black head should cause a bird to be passed, so should claret breast, blue wing bars, horizontal bearing or shape? Will they remember that the standard weight of Runners is Drake 4½ lbs, Duck 4 lbs, and that an adherence to these weights is imperative in the best interests of the breed, large size being objectionable, as indicating cross-breeding. We have in the perfect Runner a bird in which show points can be had combined with excellent laying, and we do not wish to see the breed lose its purity, and incidentally the only qualities for which it deserves keeping—its comparatively small appetite and wonderful laying qualities.

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The September Number of . . . .

The Australian Gardener

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Feeding.
Eggs.

South Australian Show Dates.

Flower Garden.

OPERATIONS FOR SEPTEMBER

:o:

Lawns.

WHERE lawns of buffalo grass are to be planted the present month is the best possible time for the operation.

In preparing the soil, which is really the most important point, a good quantity of manure should be incorporated with it to a depth of 18 in., and the whole should be trodden firmly before the surface is levelled, so that there may be no subsidence after the grass is planted. The roots of the grass may be either dibbled in at 4 in. apart or small trenches opened straight across the ground in which to lay them. The first method is the most expeditious, and if the roots are put in deep, leaving an inch of stem above the surface, there will be no fear of failure. In all cases the grass should receive one good watering, as the work proceeds.

Bulbs.

Many kinds of bulbs are now at their best, and will need careful stapling to keep them in good condition as long as possible. Nothing is more unpleasing to the eye than seeing bulbous plants neglected and laid down by the wind.

Summer-flowering bulbs, including gladioli, tuberoses, lillies, and tigridias, should be planted this month; and all require deep, rich soils.

Chrysanthemums.

Commence propagating chrysanthemums both by cuttings and a division of the roots. If for pot culture two cuttings should be put in each 3-in pot, so that when rooted sufficiently to be put into larger pots they may be separated without injury to the roots. These plants require a soil of a fairly rich texture, but it is often made too good, the result being that it is sometimes difficult to keep the growth in due check, and the plants, whether in pots or in the borders become overgrown; the stems and foliage are out of all due proportion to the flowers they produce. Too much water during the middle stages of growth is partly the cause of them becoming overgrown. A moderate supply of water until the buds are fairly formed is best, after which plenty of water and liquid manure are necessary for the production of first class flowers.

Roses.

The rose garden will require particular attention during this month. Like many other plants, roses are much improved by disbudding. Any or all buds that form in the centre of the tree or bush should be rubbed off. This prevents crowding, and throws all the strength of the plant into the roots that remain. Where roses are to be grown for exhibition purposes one bud only should be left on each strong shoot, and comparatively few flowers should be allowed to develop on each plant. When the flowers begin to open it is a good plan to tie thin white paper over each to protect them from bad weather, as the least blemish in these flowers weakens the exhibit and the coloring is not in the least affected by being covered or protected for a few days. Should aphides appear on roses, they should be dealt with immediately by spraying; a solution of soapy water is effectual, and this is made by dissolving 2 oz of common soap in a gallon of hot water, and using it whilst at a temperature of 130 deg. Fah. All roses should now be mulched with short, well-decayed stable manure.

Summer Annuals.

The main sowings of summer annuals should be made early in the month. They may be raised without artificial heat; the beds should be formed in frames, using a fine rich sandy soil, keeping the glass over them until the plants are up.

Hardy annuals may be planted to the end of the month, and others sown in the open borders for succession flowering.

Shrubs.

Choice fibrous-rooted shrubs, as azaleas, rhododendrons, and boronias for hill country will now require mulching; first, they should be dug around, but the soil must not be distributed nearer the stems than the tips of the branches, as much mischief is done by disturbing the mass of fibrous roots nearer to the stems.

Camellias.

Camellias, which succeed remarkably well when planted out in the hills, should now be put in. They require deeply trenched ground, with a good quantity of well-decayed manure, mixed evenly with the soil, and a slight shade should be provided the first summer; four stakes driven in round the plants, and a piece of bagging stretched over them is quite sufficient, as it is the mid-day sun which does the mischief.

Smilax.

SEVERAL narrow beds are better to manage than one wide one. A heavy loam, made quite rich by a liberal admixture of old stable manure, is the right kind of soil to grow smilax in. The distance between plants should be from six to eight inches, and the rows may be from eight to twelve inches apart.

The stringing of the bed should not be delayed too long after planting. A good watering down of the finished bed will generally suffice until the plants have started to grow, then water may be given in moderate quantities and at regular intervals, avoiding as much as possible too much in this particular, especially in the first part of the season, and later on every time after the strings have been cut. Cutting a string here and there all through the bed makes watering and the management of the bed a difficult task. The cutting of strings should be commenced at one end of the bed, every string, good or bad, should be taken, and the cutting be thus continued until, in time, the other end is reached. This will simplify the culture of smilax to a great extent, and will also increase the yield of the plants.

Making Gardens.

BY C. BOGUE-LUFFMANN.

Strength in varied shape is the keynote to be struck in building gardens.

THE ordinary natural and prepared materials necessary to the making of good gardens in either town or country are as follows :—

1. Soil, as distinct from the clayey or rocky mass forming the sub-layer or foundation.
2. Manure—a load or yard, serves for about eight superficial yards if soil is abundant and good ; otherwise twice the quantity of manure is necessary.
3. Gravel is needed for path making.
4. Sand is required for lightening stiff soils and for binding paths.
5. Stones are needed for the foundation of roads and paths, and also for culverts and heavy drains.
6. Rocks may be necessary for creating rockeries, furnishing margins or islands for pools, and for building walls.
7. Timber, as tree trunks, heavy limbs and roots, may be required for columns, pergolas, or rustic houses, seats, bridges, and decorating embankments; also for rustic fences.
8. Water must be available, if not for decorative purposes, as pools, falls and fountains, at least in sufficient quantity to ensure the proper maintenance of the plan adopted.
9. Drain pipes, or stone, or wood, must be forthcoming for the carrying out of a drainage system.

The quantity, variety and proportion of materials go far to effect design.

Before deciding on any exact plan or surface form, the surface must be cleared of all obstructions in the shape of timber or artificial erections. The various quantities must then be estimated and parcelled.

The levels will be determined by the outside boundaries, ground floor and door levels of house, drainage considerations, and the amount of material existing, or obtainable outside.

The drainage plan must accord with the requirements of the house, garden and paths.

The taking of levels will precede the work of moving any heavy materials, such as rocks or clay.

Apart from sites for masonry, pools or broad erections within the garden area, all the surface must be worked at least twenty inches deep by trenching, subsoiling, or making up with new material.

Stones, clay, or any other heavy and innutritious material should be kept under the twenty inches of true soil. Manure can be worked equally through the soil mass.

If a great deal of sand exists, say three-fourths, it may be mixed with crumbling clay or any shaley material.

Clay may, with advantage, be exposed to the weather during the process of trenching or subsoiling, but it must never form the surface or come near enough to get dry during summer.

The subsurface contour of the clayey or rocky formation must be correctly known at the time of trenching, otherwise weak and undrainable spots may occur.

The substratum should form clear, straight runs, and provide for an even or graduated depth of soil.

The best arrangement of surface and substratum, if we could make choice, would be about 2 ft. of mellow sandy loam over a cool sweet clay or broken sandstone, limestone or granite.

Much deeper and looser soil is required over stone than over clay. The cooler the position the less important is depth of soil. Hence the soil may often be taken from the shady and placed on the sunny side, if levels permit.

In forming banks, terraces, mounds or raised borders or earthworks of any kind, it will be an advantage if their foundations are of rock material or stiff soil, as the shape is better preserved, drainage is assured, and therefore in more favorable condition for plant growth, and it is much more economical, good soil being the rarest and dearest material to obtain.

The summer or exposed quarters will require more depth or quality of the winter or sheltered side. Failing the opportunity to make the exposed quarters rich enough to support a strong and attractive vegetation, it should be prepared for distinctly hardy, drought resisting plants, or it may be wholly or in part utilised as a rock garden.

The allotment of groups and divisions must be foreseen, previous to the handling of the heavy material, that the soil of each site or division may be specially considered at the time of preparation.

The kitchen and fruit garden, also drying grounds and other open spaces necessary to the domestic conveniences should always be brought into the scheme, and dealt with as definite features in the garden.

Straight lines will not be out of place in the kitchen quarters; but fruit tree planting and the path arrangement should, as far as possible, be so arranged that the harmony of curves will not stop short on the line of the pleasure domain.

The Order of Working.

1. Clear the surface and destroy by burning or rotting all bad litter.
2. Collect all builders' refuse, as sand, lime, plaster, mortar (burning every shaving and piece of wood), brickbats, &c., and reserve these for path making.
3. On a rough plan, mark out sites and extents for raising soil, and erections, in stone or woodwork, and put up same.
4. Trench, manure, and grade the entire area, using soil where paths and roads are to run for increasing the levels at points, or the general area.
5. Carry out the drainage system, and have water laid on.
6. Put in the foundation material for roads and paths, not less than nine inches in any case—six of foundation and three of capping material.
7. Make up any weak spots by taking from projections, or slightly decreasing the general level of a section (providing no new material can be brought in).
8. Dig over the surface of areas to be occupied by lawns, keeping the boundary levels in close relation to the borders or paths. Measure, run out levels, and obtain true grades on all margins, and then roll, grade and rake into form, ready for sowing or planting with grass.
9. Cut out borders and beds, and give such finishing touches to the surface as may be necessary before planting.
10. Put down capping of roads and paths. The crown of path or road must be the same height as the turf on either side. The turf must run right on to path at verge.

This operation completed, the garden space should reveal a distinctly pronounced form and variety of expression, as we may notice in rolling grass country, by the sea, in secluded valleys, or in the dignified formal surroundings of some noble dwelling.

The Peony in Landscape Work.

UNDOUBTEDLY the American favorite flower is one of the most effective of all early flowering herbaceous plants for use in extensive landscape plantings. It not only can be used in masses, producing grand colour results, effectively lighting up dark nooks and corners, but can also be interspersed among shrubbery, lending additional colour to such groups. The plants when out of bloom are not very unsightly, as is the case with many other herbaceous plants, but the deep fresh greens and bronzy greens of the peony foliage are maintained in general good conditions throughout the greater portion of the season. The range of peony colors is unexcelled, comprising almost all the shades of pink from the most delicate flesh tints to the deepest shades. The same may be said of white, crimson, purple and amaranth. It is weak, however, in yellow, as we have comparatively few sorts that might be termed yellow, and these are generally light in color, the guard petals being almost invariably white, and it cannot be said that there is as yet any true solid yellow peony.

Landscape architects should learn to know the peony better, and should become acquainted with the finer and more desirable sorts, and should use them more extensively hereafter than they have in the past. I am quite certain that the peony often suffers in reputation by the use of common undesirable colors in classes of work where good clean, complementary colors are needed and should be used; and the peony will never take its proper place in landscape work until landscapers in general become better acquainted with the more desirable sorts and learn to know them as well as to use them.

The general public are notified in our columns that B. Walters and Co. are prepared to turn out work in the lines advertised, promptly and correctly, at the most reasonable prices ruling in Australia. As makers of cases, boxes, and trunks for personal luggage this firm has earned a good name for the quality of their work throughout the Australian States. Fruiterers, gardeners, and others are respectfully requested to give the firm a trial. Orders executed by wire, telephone, or letter. Once take on this firm and you are sure to become a regular customer. The address is Flinders street, east of Hutt street, Adelaide.

GRIFFITHS BROS.
TEAS
SATISFY
49 Rundle St., Adelaide,
AND AT
MELBOURNE and SYDNEY.

The Haarlem (Holland) Quinquennial Bulb Exhibition.

The large hall was well filled. On the left a collection of callas in different kinds was very noticeable. This was followed by Iris, which in turn was succeeded by a group of Acer polymorphum japonicum, shown in twenty-five distinct shapes. Near by a new tulip, Tulipa Fosteriana, called forth attention; it has been recently imported; the color is a nice orange red, resembling more or less that of Tulipa Greigii. Another pot contained five of these tulips showing the same interior markings, but those of the first had a yellow, the latter a black ground, just like Gesneriana. Spiræas, parrot tulips, amaryllis (hippeastrum), real giant flowers of deepest red to snow white, next drew our notice. A great improvement in the last-named class of flowers was noticeable; a few years ago every flower was a star, now they are all wheel-shape.

A very nice group was that composed of liliums, lily of the valley, lachenalias, trilliums, watsonias, tropæolums, iris, orchids, &c. A group of twelve pots of Cyclamen persicum papilio had the largest number of flowers we ever have seen. C. G. van Tubergen was the exhibitor. A collection of sixty varieties of hyacinths in pots, shown by Messrs. Ant. Roozen & Son, Overveen, gained a gold medal, and deservedly so. From E. H. Krelage & Son, Haarlem, came a magnificent bed of Darwin tulips, 25 varieties, 10 of each in a pot. These comprised such fine kinds as Ouida (bright red), Feu Brilliant (light scarlet), Queen Emma, Psyche, Gretchen, all soft rose, and Crepuscle (light silk grey and lilac). The firm was awarded a gold medal for its fine exhibit. C. G. van Tubergen also received a similar award (prize of honor) for 30 varieties of double tulips.

Narcissus and hyacinths were well shown. Among the former were many large varieties in new sorts not yet in the trade. Van Waveren's Giant is an immense bicolor of Emperor shape; Olympia and Robert Sydenham are both immense yellow trumpets. Mina, more compact than Horsfieldii and Princess Mary, have also large, fine flowers. Messrs. M. van Waveren & Sons, Hillegam, got a first prize (gold medal) for this fine display.

The pride of the exhibition was the collection of hyacinths in glasses from G. van der Mey, Lisse. The trusses and individual flowers were immense, and their condition and fine appearance were the topic of conversation among the exhibitors. A group of 78 single and double sorts received an extra gold medal; it included such varieties as Isabella, double rose; Lady Derby, single rose; General Vetter, single white; Grand Maitre, single blue. A second collection of 18 single and double varieties, 3 of each, also received a gold medal; among them were Kastenje bloem (chestnut flower), double rose; Enchantress, single blue, &c. For other exhibits G. van der Mey also got three first prizes.

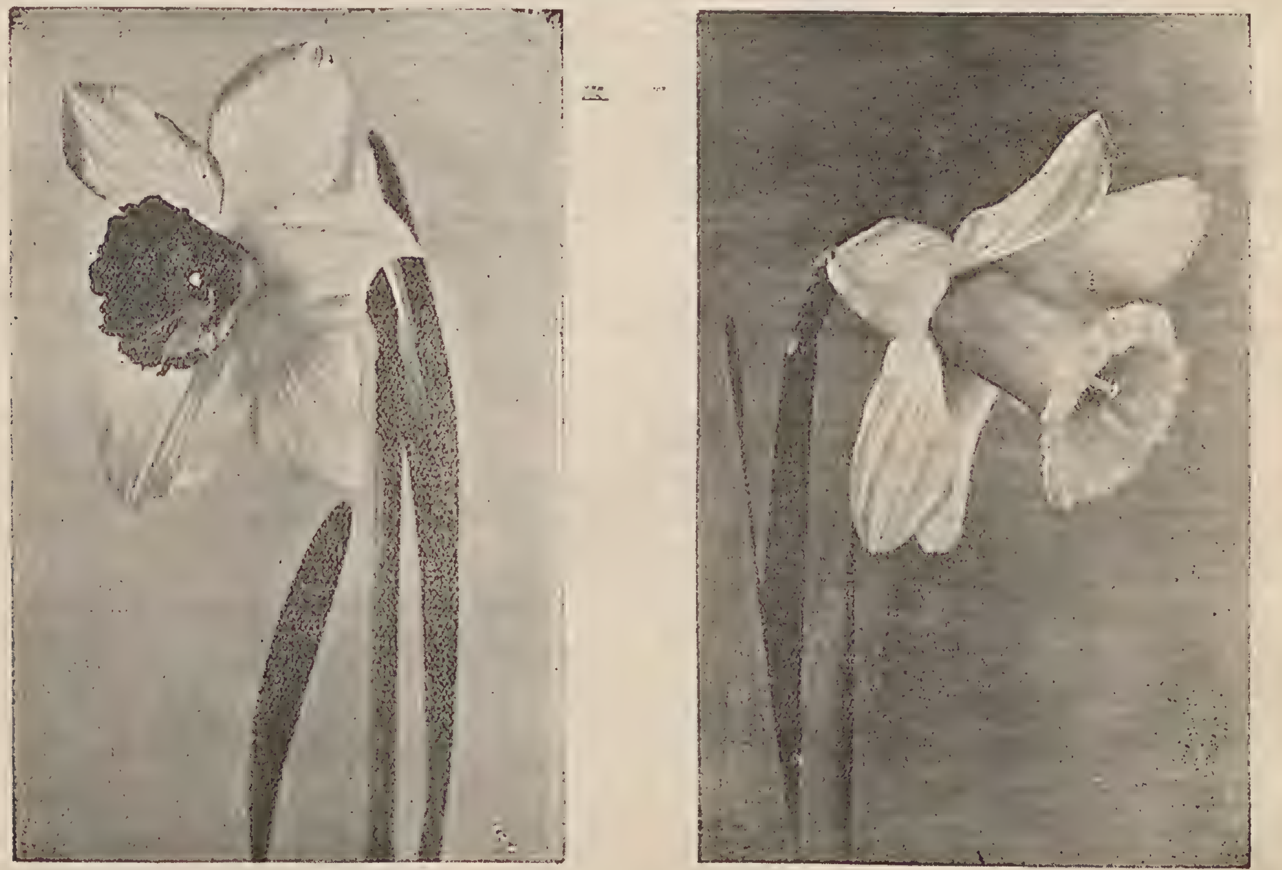
An upstairs room was filled with tulips of the kinds mostly seen at exhibitions, but a collection of cottage tulips from V. G. van Tubergen was worthy of special mention; it included Tulipa elegans, Virginalis, Picotee, Mrs. Moon, La Merveille, and many other varieties. Polyanthus narcissus, erythroniums, orchids, helleborus, &c., were also shown here.

Certificates were awarded to a late flowering single tulip named Bianca, a pure white in the style of La Reine, but a late bloomer, exhibited by P. Pryde, Heemstede, and to a single, named Red Riding Hood, exhibited by W. J. Blom and Son, Overveen. Narcissus, Van Waveren's Giant, Narcissus Winifred, and Narcissus Imcomparabilis Rosy, from M. van Waveren & Son. Iris sindjarensis var, Tubergeniana, Iris sindparensis var. Alba, Iris pur-sind (Iris persica purpurea x Iris sinjarensis), Iris sind-pur (Iris sinparensis x Iris persica purpurea), Tulipa Fosteriana, Freesia Tubergen's Mauve, and Freesia Tubergen's Carmine, all from G. C. Tubergen, Jr. The two freesias last named, seedlings from Armstrongii, were generally agreed to as the novelties of the exhibition.

On Saturday the Queen Dowager paid a visit to the exhibition; and on Sunday the hall was thronged by the workmen from the different bulb establishments of Holland.

The award jury was composed of the following well-known horticulturists:

P. Rudolph Barr and Herbert J. Cutbush, London; R. Wilson Ker, Liverpool; Alfred H. Pearson, Lowdham; John Pope, Birmingham; Walter T. Ware, Bath; Fr.



BARRS' DAFFODILS

Benary, Erfurt; Michael Buchner, Munchen; C. Kommer, Bremen; Rudolf Seidel, Grungrabchen; August Siebert, Frankfurt; W. Swoboda of J. C. Schmidt, Berlin; Philipp Siesmayer, Frankfurt; A. Chatenay, secretary of the National Horticultural Society of France; K. J. Kuyk, Mont St. Amand; H. Martinet, Paris; Charles Pynaert, Ghent; A. Truffaut, Versailles; Albert Viger and Philip Leveque de Vilmorin, Paris.

Flower Fashions.

All kinds of floral arrangements for funerals, &c., are now made up with a much better groundwork, and the framework, being covered with moss, keeps the flowers up much better. Maidenhair fern is very little used. Ivy leaves, bronze-tinted berberis foliage, croton leaves, and other substantial foliage make a better base and last well. We cannot quite get away from the old conventional wreaths, yet generally other designs are more in favor, and colored flowers are used extensively. I find that for wedding bouquets the Parma violets are much in favor. At the fashionable wedding of Marconi the bridesmaids' bouquets consisted chiefly of these violets, and I have lately seen several other wedding orders, where they have been the leading feature. In fact, they seem to be taking the place of the carnation Miss Joliffe, which was so indispensable a few years ago. But this old favorite I find has not quite died out. The other morning I saw some good blooms in the market.

Sweet Pea Notes.

ECKFORD is well to the fore with new varieties this season and has reason to congratulate himself on the success which has attended his efforts, seeing that he has induced the Royal Horticultural Society to brea one of its most important rules by granting an award of merit to the new orange tinted salmon. Henry Eckford, before it has been tested at the gardens of the society. The color of this charming variety is so distinct and desirable that few will be found to cavil at the decision of the committee. The individual flowers are large and of perfect form, and are often produced three on a stem. The collection also included Romolo Piazani, which will doubtless become the leading blue; Miss Philbrick bears a strong resemblance to Flora Norton; Admiral Togo, a washedout Duke of Clarence; with nothing to recommend it; Scarlet Gem, nearly double the usual size, snd in several cases carrying three flowers on a stem; King Edward VII., with wings so distinctly purple as to be unrecognisable and serving as a foil to Queen Alexandra, a new scarlet of giant form, which is said to have the additional merit of not suffering from sunburn. We shall see. If the degeneration in King Edward VII. is permanent, its use and popularity are ended. The noble Earl of Fordhook (Howard M. of that ilk) was an interested and interesting visitor at the exhibition.

In connection with a trial of more than 250 varieties the following dates are interesting: Burpee's re-selected extra early in full bloom, June 12; Mont Blanc, June 20; Sunbeams, June 22. The rest nowhere.—Florists' Exchange.

Rose Growing.

By M. H. Walsh, before the Gardeners and Florists' Club of Boston.

THE subject, rose growing, is one with which you are all familiar, being either professional gardeners or florists or both. The subject will, of course, be old and somewhat dry: so much has been said and written on it I feel there is nothing new I can speak of, and at most my remarks this evening can only recall to your memory what many of you learned in your apprenticeship days in other lands. There is no secret in the growing of garden roses. The fundamental principles of growing roses, as taught and practised 45 years ago in England, and that is as far as my memory serves me, hold good now. While we have to modify them to some extent, owing to climatic conditions, the salient and most important essentials apply to rose growing in the open ground here.

The question of soils, pruning, and all relating to roses at that time was discussed in the Gardeners' Chronicle and Shirley Hibberd's Floral World and other horticultural papers. This book I peruse with a great deal of pleasure. It was then comparatively a new subject. Some fresh varieties had been originated since 1845, when the old rose La Reine was first discovered, and this rose was the first break of the new class called hybrid perpetuals or hybrid remontants. This class multiplied very rapidly after 1860; at that date the varieties numbered only about 25 or 30; at the present time they run into the hundreds. Many of those grown at that time are displaced by superior kinds.

It is a most encouraging sign to see an increased interest throughout the country. While I cannot expect to tell yon anything but what you already know, it may interest you by recalling pleasant recollections relating to roses.

Hybrid Tea, Hybrid Perpetual and Climbing Roses.

There are several phases and aspects in the successful growing of roses. In order to rear fine roses each plant must be carefully observed. Neglect or failure to carefully attend to the requirements of this flower manifests itself in the appearance of the plants. They speak for themselves, and make evident to the familiar and keen observer whether they received proper treatment for their best growth and development.

The Important Essentials.

The important essentials are soil, location, quality of stock, pruning, watering, guarding against insects, and fungus; hoeing, etc. All these contribute to the health and vigor of the rose plants; neglect or failure to attend to them show to a greater or less degree, as they all combine to make the perfect rose.

Soil.

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That hardy roses grow in ordinary garden soil cannot be questioned, providing drainage, location and so forth are right. The quality of the flowers will be just in proportion to the culture they receive. Hybrid perpetual roses thrive best in a stiff loam. A little clay mixed in the soil is beneficial; this retains moisture and keeps the soil cool. Good drainage is an important factor, as roses do not thrive satisfactorily in cold, stagnant soil; therefore, drainage should be provided if the subsoil is not porous to leach away surplus water. It is not during the growing season, with our usually hot, dry summers, that improper drainage affects the health of the plants, but in the early spring when growth should take place; plants show the effects, having Winter killed badly and being loth to start. This is caused by cold, damp ground. Probably the roots have been encased in ice during the last couple of months. Therefore, although this seems a small matter, it is one of the essentials that should not be overlooked, as it contributes largely to the health of the plants. Roses do not like cold toes.

Location.

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Location is another important essential to the proper growth of roses, an exposure from southeast to southwest being the ideal spot. The early morning sun is the most beneficial, as the plants make more growth from sunrise to 8 a.m. in the open than during the remainder of the day. A spot sheltered from the strong winds and fully exposed to the sun should be chosen to get the most satisfactory results.

Feeding.

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It is needless for me to remark that roses are gross feeders, and that means good, rich soil. If in good, cultivated soil—by that is meant watered when necessary, keeping free from insects, fungus and mildew—the foliage is luxuriant and strong, and a pleasure to look at; if, on the other hand, the growth is feeble and the foliage more yellow than green, it denotes poor soil, poor drainage, or both, or lack of sufficient plant food. The keen observer quickly detects this condition, and then takes steps to apply the remedy.

A good rose bloom carries with it good foliage; you cannot easily get one without the other; they are inseparable, as the flower is only the foliage developed, and this means good food, frequent syringings and applications of water. The leaves of the plant are termed the lungs, and they absorb a quantity of nitrogen from the soil; hence the necessity of rich soil, as you cannot get nitrogen if there is none in the soil. You cannot take from the soil what it does not contain. It is from the soil the plants sustain life and exist. The soil should receive careful condideration.

Cultivate Frequently.

Stir or hoe the ground frequently when there are no weeds: this is beneficial to roses. Take and hoe a piece of the rose garden for proof of this, and leave a piece alongside not hoed; next morning compare and observe the plants that has the heavier dewdrops on the leaves, and consider the reason for it coming on one lot of plants and not on the other.

Pruning.

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The pruning of hybrid perpetuals should be carefully done, having in mind the character of the varieties. The feeble growing roses, such as Gustave Pigneau, Marie Bauman, Marie Finger and others of like character should be pruned to 3 or 4 eyes from the ground; that is to say, for the feeble kinds, prune close, and for the more vigorous, not so close. This may be termed pruning for quality. The method pursued generally in this country appears to be based on quantity rather than quality, sparing the knife and exhausting the plants by over-cropping and producing quantity instead of quality. Far better 16 or 20 good first-cless blooms than 40 or more inferior ones. By pursuing this system of pruning it promotes and encourages strong shoots for next year's flowers. The number of shoots for the plants may be determined by the size and vigor of the plants; this applies to the hybrid perpetuals or remontants. Close or severe pruning, as it may be termed, practically produces strong, young vigorous wood, even on very old plants, and they may be cultivated for many years, providing the plants are taken up and the roots pruned once in six or seven years.

The following list contains the names of 24 of the best varieties—

Alfred Colomb, Baroness Rothschild
Abel Carriere, Chas. Lefebvre

Clio, Dr. Audry, Duke of Edinburgh
Earl of Dufferin, Etienne Levet
Frau Karl Druschki
General Jacqueminot, Heinrich Schultheis
Horace Vernet, Jubilee
Louis Van Houtte
Madame Gabriel Luizet, Marie Bauman
Marquis de Castellane
Maurice Bernardine
Mrs John Laing
Mrs R. G. Sharman-Crawford
Margaret Dickson
Prospier Lauger, Ulrich Brunner

Winter Protection of Hybrid Perpetuals.

I find drawing the soil around the base of the plants, the same as you hill up potatoes, sheds off the rain, keeping the soil dry around the base of the plants. Hill up 8 or 9 inches and fill in and over the surface 4 or 5 inches of manure. This protects the roots and is in good condition to dig in the Spring. This may be done eary in November, it having a tendency to harden and ripen up the wood before the severe cold season sets in. The object of hilling is to protect 8 or 9 inches of the wood; it matters little if the tops do winter-kill. Sometimes I think the latter a blessing in disguise, especially if close pruning is not practised.

Insect and Other Enemies.

Hellebore dusted on the leaves early in May, as the season leaf appears on the young shoots, destroys the leaf roller or slug. Usually 2 applications are sufficient. Thrips only attack plants in hot, dry seasons, at the time the ground is deficient in moisture. Call into requisition the force pump, or hydrant hose, syringing the bushes on the under side of the leaves. Do not delay for the elements to supply the necessary fluid: delays are dangerous.

For exterminating aphis frequent syringings by force pump or hose proves effective and beneficial. For mildew sulphur dusted over the affected plants allays this disease. For rose or Hesian bugs, hand picking is the only good remedy. A preventive is to plant near small white shrubs, Viburnum opulis or white wegelias, this attracts the rose bugs. A white flower has a peculiar attraction for them. The bug is the most detestable and destructive pest to contend against.

The Hybrid Teas. ......

This may properly be called the true perpetual rose. While the number of varieties that have proved hardy enough to withstand this cimate is not large, there are at least 15 sorts that prove most satisfactory, with careful cultivation and protection.

This class of roses requires a light, sandy soil for the best growth and development. The hybrid teas are growing in favour each year. This is the coming rose, and in the course of ten years I predict these will displace or supersede the hybrid perpetuals to a large extent. The large number of new varieties which will be introduced within the next two years, together with the kinds proving hardy and already been grown here, will made a choice list of ever-blooming roses.

The new address of the "Australian Gardener" —The corner of James Place and Grenfell street, City.

Georg Lloyd,
Painter
Of Garden Scenes, Flowers, Panels, etc.

Address—Geo. Lloyd, care of Caxton Printery, Adelaide.

The Orchard.

OPERATIONS FOR SEPTEMBER

Citrus Trees.

ORANGE, lemon and other trees of the citrus family may be planted. Although the early autumn is the best time in which to plant them, where a plentiful supply of water is at command through the summer September is a suitable month. As soon as the trees are in place they should be mulched with new stable litter, as this keeps the soil at a cool temperature through the hot weather. The soil cannot be too carefully prepared for the orange tree; deep soil with good drainage is the chief essential to success. Whether the ground selected for planting be river alluvial or ordinary paddock land, it is necessary to break up the whole to a depth of 18 or more inches, and as the trenching proceeds to evenly incorporate as much decayed stable manure as is available. Failing a good quantity of this, bone manure would answer for mixing with the subsoil, coarse bonedust being far better for the purpose than fine stuff. So far as the surface is concerned it is necessary to provide well decayed stable manure to fork in close to the trees to give them a start.

Pruning ......

should be carried on with dispatch, and as a thorough system of spraying is the only hope of the orchardist against the codlin moth pest a system of pruning must be adopted to suit the use of the spraying machine. This means an open-headed tree, with ample space between the branches—a rather low spreading habit, which will make it easy for fruit gathering as well as for spraying and pruning. The height of such a tree should not exceed 10 ft., and it would be better a little lower if the nature of the tree will allow of such a habit.

Scraping. .....

All pruning being finished, attention should be paid to the stems and main branches of deciduous trees. The rough barh that forms shelter for the larvæ of insect pests should be carefully scraped off and the whole surface afterwards washed with lime. This acts beneficially in several ways: it keeps the sap of the trees cool in hot weather, prevents the lodgment of insects, and also the growth of moss and lichen. It is important to keep the hose busy during the month, and in large orchards the horsehoe should be used at least twice, as then the ground will be kept quite free from weeds, as they are easily destroyed when young.

Grafting

may be carried on through the month. In the case of old, healthy trees of inferior varieties of apples and pears, it is the best plan to cut back the branches, allow new branches to form in the summer, and then put the grafts on the best placed shoots the following spring. In this way the graft and stock will be the same size and fit perfectly, and the stock will not receive so severe a shock as when denuded of its young growth, except that which finds its way through the grafts. The lopping off of branches checks the stock but little, but when the new shoots that form are kept rubbed off, as is usually done with newly-grafted old stocks, the check is very severe. This method of grafting is well-known and is as follows: Putting the grafts in the ends of the stumped branches; shaving the lower end of the scion into a triangular shape and inserting it between the bark and the wood. The grafts unite readily in this way, but the stock does not recover so well as when the first method mentioned is practised. Inferior varieties of grape vines may be grafted with approved sorts through the month. The work is done thus—The soil is taken away from the stems to a depth of about 10 inches, the vine is cut off 4 to 6 inches below the surface, and the grafts either wedged into the top or slipped into a cut on the side of the stem. The scion or graft should be tightly tied in position, one eye projecting above the surface, and the excavation refilled with soil.

Strawberries. .....

Where strawberries are grown it is important to weed the beds and to spread mulch amongst them. The beat material for this purpose is stable litter from which the short stuff has been shaken. This acts also as a manure, as the rains clean the straw and carry the manurial elements into the soil.

Raspberries .....

should be finished off early this month. After pruning the canes and tying them in position the ground should be manured and forked over, and then the whole surface can be mulched with long new stable litter.

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HORTICULTURE.

We cull the following from the "Experiment Station Record," published in Washington, U.S.A.:—

Grafting.

In an experiment to determine the reciprocal action of scion and stock, scions of Yellow Transparent apple were inserted into branches of the wild crab. After fruit spurs were formed on the Yellow Transparent scion, all the leaves from the scion were removed so that all the sap was elaborated by the leaves of the wild crab. "At the same time a scion of the same Yellow Transparent tree was inserted into a twig of the same branch and allowed to form its own leaves." The fruit produced on the scions thus treated was practically alike in size, color, and flavor, and in both instances the fruit was clearly Yellow Transparent.

Experiments in grafting apple on whole or piece roots have now been under way at the station for a number of years. Some of the trees have borne fruit. Up to the present time it is difficult to detect any difference in the size of the different trees treated. It seems to be practically settled that each variety will form its own root system regardless of the length of root used as a starter.

Best Yields of Apples.

The average yields of a number of varieties of apples for two years indicate the varieties Wealthy, Yellow Transparent, Okabena, Hibernal, and Duchess, in the order named, as the heaviest yielders. Orchard experiments at the station indicates that trees should not be set closer than 20 ft. apart in that region.

Some Experiments of Luther Burbank

(By D. S. Jordan.)

An excellent account is given of a large number of flower, fruit, nut, grass, and grain creations of Luther Burbank, during recent years, with extensive notes on Mr Burbank's views concerning the methods and philsophy of hybridizing.

Mr Burbank believes that "mutations can be produced at will by any of the various means which disturb the habits of the plant." Variations can usually be fixed in five or six generations and sometimes at once. "There is no evidence of any limit in the production of variation through artificial selection, especially if preceded by crossing. . . By crossing different species we can form more variations and mutations in six generations than will be developed by ordinary variation in a hundred or even a thousand generations."

The evolution of species is largely dependent on crossing the variations contained within it. Forms too closely bred soon run out, because generally only by crossing does variation appear. It is of great advantage to have the parents a certain distance apart in their hereditary tendencies. If too close together, there is not range enough of variety. If too apart, the developed forms are unfitted for existence, because too unstable. Correlated changes work together to produce the effect of mutations. . . Radical changes of environment for a series of generations will produce a tendency to sport, but hybridisation will bring it about far more abruptly, and for practical plant or animal breeding or for scientific study of all these variations, far more satisfactorily.

Mr Burbank has produced a number of species by hybridisation which he believes to be as good as nature itself has produced. It is asserted that there is a close analogy between hybridisation and grafting. An instance is cited in which Prunus myrobalana var. pissardi was imported from France and grafted on the Kelsey plum, a variety of Prunus triflora. The graft did not bloom; but its presence on the tree brought about a cross between the two species. Many hundred descendants of this cross are now living.

In one sense hybridisation is believed to be only a mode of grafting. A diagram is given showing the zone of life and parallelism of results in crossing and grafting. Mendel's law which holds good for the tribe of peas has not been found to be generally true so far as Mr Burbank's experiments go.

The results of crossing are sometimes very simple, and at other times are so complicated that to follow them requires the highest skill, and even then may be utterly impossible.

An instance is cited in which a Siberian Rubus (R. cratægifolius) was crossed with a California blackberry (R. vitifolius). Some of the hybrids obtained combine the best qualities of both fruits, and out of over five thousand second generation seedling every one has proved true to seed. A hybrid red poppy was obtained by uniting the opium poppy with the oriental poppy. The second generation hybrids thus obtained all prove perennials, and blossom every day in the year, while the parents are annuals and blossom only for a few weeks. The hybrid poppy produces no seed. New spineless cacti for stock-feeding purposes have been secured by crossing together five species of Opuntia.

It is stated that crosses are sometimes more vigorous than their parent, and at other times the reverse is true. A peach-almond cross is cited, in which the hybrid produced a tree ten times as large as either parent of the same age.

Heredity.

Heredity is defined "as the sum of all the effects of all the environments of all the past generations on the responsive ever-moving life forces." Crossing is stated as the grand principal cause of all the species and varieties of earth, sea and air. Relative to the formation of acquired characters, the author states that "similar environments produce similar results on the life forces, even with the most distantly related plants or animals. This fact alone should be proof enough, if proof were still needed, that acquired characters are transmitted."

The parallelism of grafting and hybridising is pointed out. "Grafting or budding may be called a bio-mechanico-chemical combination. While crossing by seed is more of a bio chemical union, yet this last union is often more truly mechanical than chemical as is the case of a mosaic union, which is not unusual when the cross is too abrupt. In fact every gradation from a purely mechanical union to one of perfect chemical blend is a common every day occurrence with those who have carried out field experiments on a broad and comprehensive scale."

Tomatoes.

In some tomato forcing experiments a test was made of the relative value of sub v surface irrigation, and also garden soil v light sand. The three varieties, Burpee Combination, Success and Stone were used. The results obtained are given in condensed form. The heaviest yields in every case but one was produced by sub-irrigation. The variety Combination produced more fruits by surface irrigation, but the average weight was less than by subirrigation.

The yield in sand was less in every case and the weight below those in garden soil. Fruit ripened about a week earlier on the surface irrigated plats than on the sub-irrigated plats.

The variety Success was pollenised with pollen obtained from itself and from Combination and from Stone. The yield of Success when pollenised by itself was 187 fruits; when pollenised by Combination 149 fruits, and when pollenised by Stone 196 fruits. The fruits were of practically equal size in all cases. The results indicated that success in tomato forcing may be governed to a considerable extent by the variety of pollen used in cross fertilisation.

Experiments with Vegetables at Montana

Lima beans have uniformly failed at the station. The yields of 44 varieties of bush beans are recorded. The heaviest yielding varieties in order were White Seeded Wax, Davis Wax, and Long Yellow Six Weeks. Succession has proved the best early variety of cabbage, and Late Stonehead and Danish Round Head the best late varieties. With cauliflower, the Best Early variety was ready for use about one week before Dry Weather. Early White Cob has proved the best variety of sweet corn tested at the station. It matured a full crop, while Cosmopolitan matured about 30 per cent of a full crop. With beets, Improved Blood Turnip gave the earliest and largest yield of a number of varieties tested. Thorburn New Everbearing was the earliest and best pickling cucumber grown.

Onions in Montana.

A test of transplanted v field-sown onions showed an average yield of 13,939 lbs per acre for the field-sown onions, and 32,334 lbs per acre for the transplanted onions. The author is of the opinion that it does not take any more laber to transplant seedlings from a flat or hotbed than it does to plant thin field sown plants. The yields obtained with a number of varieties of onions are tabulated. Twelve varieties of tomatoes were grown. The station experiments with this crop indicate that the most ripe fruits can be obtained by planting on moderately heavy clay soil. By frequent cultivation and the use of plenty of water early in the season, the plants can be forced into early growth, and by the withdrawing of these later in the season the fruits can be induced to mature earlier than they otherwise would.

Forcing Beans. (By C. A. Vallejo)

The results are given of experiments of growing beans under glass. The author considers that there is no advantage in starting beans in pots, as is often advised. It is rather a waste of time and labor. Better results were secured when beans were planted in hills about 1 ft. apart each way, than when planted about 3 in. apart in drills 30 in. apart. Much better results were secured when they were thinned to stand 18 in. apart in the row than when they were left unthinned.

The yield of beans increased about three times by the use of complete commercial fertilisers. Two varieties of beans were grown, Ne Plus Ultra and Golden Eyed Wax, the formed of which was much the more productive. Tobacco smoke used for fumigation was found to seriously injure the plants. The white fly (Aleurodes vaporium) was easily controlled by fumigating with hydrocyanic-acid gas, using 10 oz. of potassium cyanid for about 6,000 cu. ft. or space. It is believed that nothing is gained by giving the plants too much heat, for while they come to maturity a little earlier the yield is much less than where the temperature is lower. About 50 to 60 degrees F. at night and 70 degrees F. in the day time are believed to be about the right temperatures.

Forcing Tomatoes. (By W. J. Green and C. W Waid, Ohio Station).

The station has not found it profitable to grow a crop of tomatoes in mid-winter in Ohio. The prices which can be obtained for them are not high enough, and the quantity that can be disposed of is too limited. The crop has proved profitable, however, as a spring and early summer crop. At such seasons tomatoes have proved more profitable than either lettuce or cucumbers during the same period.

The price received for tomatoes grown in the greenhouse has usually been considerably higher than the price paid for southern tomatoes in market at the same time, the quality being better when allowed to ripen in the greenhouse than when the tomatoes were shipped in a green state from the South. Tomatoes at the station are usually grown on raised benches with about 6 in. of soil, since they have been found to mature earlier there than in solid beds. The average yield up to 1903 has been at the rate of 2 lbs. 4 ozs. per square foot, or 9 lbs. of fruit to a plant. The plants have usually been grown 2 ft. apart each way. The price has varied from 5 to 20 cts. per pound. In 1904 the first picking was secured June 10, and up to August 1 the value of the fruit had averaged 20 cts. per square foot.

An experiment was made in sub-irrigation v. surface-watering tomatoes in the greenhouse. In the experiment the yield of fruit per square foot in the sub-irrigated beds was 2 lbs 4½ oz. The fruit had an average size of 5.9 oz., and the amount of rot per square foot was 1.9 oz. In the surface-watered bed the yield of fruit per square foot was 1 lb. 15 oz, the average size of the fruit 5 oz, and the amount of rot 4.7 oz. per square foot. No mulch was used in either case Particular attention was given to supplying the amount of water needed for the best development of the plants in each case. More water and more time was required to surface-water than to subirrigate. The authors state that "mulching with strawy manure accomplishes the same results as subirrigation. It is more beneficial, however, with surface than with sub-watering."

Two experiments are recorded in testing different methods of training tomatoes in the greenhouse. In the first experiment some of the plants were set a foot apart each way and trained to 1 stem. Others were planted 1½ ft apart each way and trained, some to 1 and some to 2 stems. The largest yield per square foot of space was obtained by settingg plants 1 ft apart each way and training to 1 stem. The fruit thus grown however, was about an ounce lighter, on the average, than where the plants were set at a greater distance. The plants set 1½ ft apart and trained to 2 stems stood second in yield. The lowest yield and the largest amount of rot occurred where the plants were set 2 feet apart each way and trained to 2 stems.

The experiment was repeated, using a much greater amount of space, and the 2 varieties of tomatoes, Stone and Beauty, were grown. The yield of fruit on different dates and the total yield are tabulated. The results were not quite uniform with the two varieties. "The thick planting gave the best yield with the Stone, but the result was less marked with Beauty. Each variety showed a marked advantage for the thick planting over the thin, so far as early maturing is concerned."

This is a point of considerable importance, since the best prices were secured with the fruit early in the season. Considering the matter from this standpoint, the close planting is a decided advantage in both varieties. With the Stone variety particularly, the early ripening was not only marked, but the total yield was much in favor of thick planting.

A test of 33 varieties of tomatoes was made during the season, and the date as to early and total yield and average size are recorded for each variety. Brief descriptsons are also given for all but 5 of the varieties. The fruit of 12 varieties is illustrated.

The bulletin contains directions, based upon the experiments at the slation, for the care of tomatoes in the greenhouse, on the insects and diseases affecting them, on methods of marketing and on varieties. It has been found desirable to sow the seeds in flats about the first of December. Where the time is limited, the plants are transplanted from the flats into 2½-in. pots, and later into 4-in. pots, where they remain until ready to be planted in the beds. With proper care they should be ready for budding by the middle of March.

Coarse wool twine has been found most satisfactory as a support on which to train the vines, and raffia the most satisfactory tying material. The severe pruning which it is necessary to give tomatoes in the greenhouse sometimes causes the fruit spurs to send out suckers. These should be removed. The white fly has been the most serious insect pest with which the authors have to contend in this work, and the leaf blight (Cladosporium fulvum) the most serious disease This disease has been controlled when Bordeaux was used early in the work. In marketing, the fruit is carefully graded and sold in 5 lb. baskets.

Vegetable Garden.

:o:

OPERATIONS FOR SEPTEMBER

September is a busy month in this department, because the weeds, as well as the crops, grow rapidly and require constant attention. Weeds should be attended to in the springing stage, as they are easily destroyed. Seed rows of carrots, beet and parsnips should be carefully thinned, the first named to 2 in apart, the other two to 5 inches apart.

Asparagus

beds should be made ready for planting; the excavations should be 18 inches deep and refilled with soil and manure in equal parts, mixed together. As these beds continue bearing for 50 years or more the work is important. Presuming the beds to be already prepared, namely, well manured and left open to a depth of 6 inches, the roots should be spread out in rows 16 inches apart and 12 inches from plant to plant. They are then covered with a mixture of decayed mannre and soil in equal parts, the excavation being filled up to the general level. Every preparation should by this time be made for sowing and planting summer crops. The best operation is to set apart a plot of ground, heavily manured and trenched to not less than 18 inches deep. Not nearly so much water is required for deep ground, neither do the plants feel so much the effects of the heat.

Rhubarb, &c.

Rhubarb, seakale and globe artichokes should be planted early in the month. They are placed in beds or rows in deeply trenched or heavily manured ground. If in beds, they should be planted 3 ft. apart each way, so that there may be ample room to dig between them.

Cabbage,

Main lots of early summer cabbage, mostly flat varieties, should be planted, and another batch planted to provide midsummer and autumn supplies.

Frames.

Make up frames to raise summer vegetables, as capsicums, tomatoes, marrows, and melons. Sown this month plants wlll be ready for planting in October. They should be raised in frames set upon heaps of fresh long stable manure, which provides just sufficient heat to bring them forward.

The well-known firm, E. and W. Hackett, 73 Rundle stret, announce by advertisement that they are selling seed of zinnia elegans and robusta permitsima in 6d and 1s packets.

If Mr John Sheridan had not taken to the stage he would have been a floriculturalist, judging by the floral decorations on the stage In the musical burlesque "The Earl and the Girl" the display of roses is most lavish in the scene in the second act, and the garlands of flowers used by the singers and dancers is a lesson well worth the attention of those who are fond of utilising flowers for artistic display. Mr Sheridan has spared no expense in this respect, and he is well satisfied with his reward, the hearty appreciation of the crowded audiences which nightly greet the musical production, "The Earl and the Girl."

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THE POULTRY YARD.

Breeding Table Poultry.

BY D. F. LAURIE.

THE Adelaide market is ill supplied with table birds, even of moderate quality, when judged from an Adelaide standard. Those who study the market reports will have noticed that what are called "young, prime heavy weights" sell at a considerable advance on rates obtained for ordinary descriptions. There is always a good demand for the very best samples of produce, and table poultry is no exception to the rule. At the present time most attention is being paid to the laying breeds, and as egg production only is considered, there is but little advance as regards quality in our table poultry. The production of table poultry requires considerable skill in feeding, that is, of course, supposing that you have the proper breeds for the purpose. There can be no doubt that in this State poultry is regarded as a luxury, and not as a regular article of diet, highly suitable, especially during hot weather. Even moderately good table birds are difficult to obtain, and the average bird offered for sale cannot be regarded as very tempting, nor as an economical item in the bill of fare. Occasionally one sees in the salerooms small lots of pure bred birds—the culls from some big breeder's yards—and when such are of suitable breed a fair bird for table use can be looked for. In view of the scarcity of prime table birds, and the general unsuitability of the skinny mongrels generally offered, it cannot be wondered that the local demand is at present somewhat limited, and that so few people eat poultry. There is no doubt the demand would increase if a really good class of table bird could be depended upon by the consumer. There are great numbers of people in the suburbs who rarely eat poultry, because they are unable to obtain good birds. As a matter of actual fact, the South Australian has but a hazy idea of what constitutes a good table bird.

At the recent Poultry and Kennel Club's Show there was a great display of dressed table poultry—the largest seen in Adelaide—and perhaps not excelled at any previous Australian show. In looking at the exhibits from a critical point of view, we have to remember that July is not a favorable time for displaying table birds to the best advantage. However, the point is, that out of the whole exhibits there were but two which can be regarded as possessing the chief points of a table fowl. These are: Shape and correct position of meat, texture and colour of flesh and skin. I took particular nottce of a number of visitors who were inspecting these birds, and with few exceptions the very large and often coarse, uninviting specimens, appealed to them as the most desirable. Quantity is a poor standard to judge table birds by. It is adopted only in Australia, but certainly not in England or America. Some of these large birds weighed 10 and 12 lb. live weight, and at the price of ordinary mutton (6d. per lb.), would be worth 10s. to 12s. a pair. Even if the quality were all that could be desired, such weights are far too great, and the cost too much, for ordinary table fowls. This is not the class of bird that can be bred at a profit—such birds have been kept too long—they have passed the time when, with proper feeding, they could have been sold to the best advantage. We want a smaller and more compact bird for general use. Birds with huge tough legs are neither inviting in appearance nor satisfactory to the palate. The leg is not looked upon as one of the choice morsels of a fowl, and therefore undue development in that direction, rather than being a gain, is distinctly the opposite.

The more compact and shapely birds, with well developed wings and long, deep breast bones, are generally the result of a cross, and this cross must have Game—Indian or old English—as one element, as the Game fowls alone have the necessary shape which they can impart to their progeny. The modern English Game—the long-legged specimens generally seen at our shows—have too long legs, and therefore will introduce an element undesirable in more ways than one. The Malay has often been put forward as suitable for crossing, but in practice this breed has been found wanting. Certainly fair specimens have been produced time to time, notably the Malay-Dorknig cross, but the great length of leg has detracted from its appearance, and besides, the quality of the Dorking is not improved by the coarser Malay. At one time the Malay-Cochin was recommended, with size as its main feature. For coarseness of skin and flesh, bad colour and general inferiority, this cross would be hard to beat. Without doubt the best specimens seen in Adelaide have had Game blood in them, as a rule crossed with Dorking. The most desirable table bird for the English trade has always been the Game-Dorking, and on this point there is but one opinion. For our local trade we can provide an excellent table bird by using Game sires on Wyandotte, Langshan, Orpington and Plymouth Rock hens. These will be found most satisfactory, as they are quick growers, and if properly fed are plump from a month old. Such chickens at forty-two days old are sold in America as "squabs," and in France as petits poussins, and as such are in great demand. These crossbreds grow rapidly, and at any required age may be topped off, and sold in prime condition at a total cost much below the average for a much older common or unsuitable bird.

In England and throughout Europe and America the practice of raising table birds profitably has reached a great pitch of perfection. The breeders have certain markets which are practically governed by an age limit—the chicks have to be in fit condition at a certain age, or the market is lost, and the birds must be carried on another stage. It is the adoption of similar methods that is now advocated, for it is absolutely necessary to conduct table poultry breeding on a definite basis. You must first of all obtain stock of the proper quality, and these must be housed and fed properly to obtain a fair supply of eggs, from which stock of sound constitution may be bred. Remember that constitution is a most important factor in poultry breeding, just as much so for table birds as for egg production. The question of hatching by hens or with incubators depends largely on the scale of operations. In any case, the young must be well fed all the time, as a check is fatal to success. Grading the chickens is of the utmost importance all through the growing period, big and little must be kept distinct, using age as an additional guide. The chickens do better under control than on extensive range. The main object is to get sufficient range, and have the birds plump and heavy by a given date from hatching. The birds must be killed as soon as fit. The future need not be considered, as is the case with birds being reared for stock purposes, under which circumstances a fair amount of range is dssirable. Movable yards are convenient for giving a change of ground, for the young birds must not remain on tainted ground. Their sleeping quarters must be roomy. Close, ill-ventilated coops and houses will stunt the growth and cause disease and loss. It must be remembered that a coop which is ample for 100 chickens for the first few days will soon accommodate only one half that number, therefore the birds need to be frequently transferred as they progress. Towards the end, grade according to condition and size, so that the most forward can be topped off and disposed of first, followed in turn by each grading.

For about twenty-four hours after hatching Nature provides all the food required by the chickens, but a liberal provision of clean, coarse, sharp sand should be made, as it will be found that the chicks will eat some of it for use later on in assisting digestion. The old practice of giving hard-boiled egg has now but few supporters, as there is abundant evidence that it is responsible for bowel trouble. Dry feeding is popular with many American breeders, but is more suited to stock bird breeding. Hard food, such as a mixture of various grains and seeds, cracked and screened, gives excellent results in every way, and may be recommended for the first month, after which a little soft food, or mash, as the Americans term it, may be slowly introduced. I have always found rough oatmeal an excellent food, fed dry for a few days and then once or twice a day slightly moistened with yolk of egg, whipped in skim or separator milk. This, followed by a good grain mixture, cracked and sifted, and fed in chaff or short straw, suits the birds admirably. In searching the straw for grain they obtain plenty of exercise, which promotes health, growth and digestion. At a month old, soft food or mash may be fed twice a day. Use the grain mixture passed through a mill to reduce it to a coarse meal. Green food, cut finely, may form at least one third in bulk, and the whole may be moistened to a crumbly state with a little soup, made of bones, liver, or scrap meat free from any taint. After a week of this feeding a little soup may be added, but do not overdo it, nor use green bone for this class of bird. Feed a little at a time at short intervals. Keep the young on the hungry side all day. This will force them to scratch well, and you are thus sure of good digestion. The big American breeders attach much importance to this point.

The use of skim, or separator milk as a poultry drink and food has been much debated. Briefly, it is advised to use it in all forms in tht soft food, because it is then consumed withou delay. If used as a drink, our climatic conditions soon bring about a change, and it is wel

The October Number of . . . .

The Australian Gardener

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Flower Garden.

## Operations for October.

BY J. CRONIN.

SEASONABLE WORK will include the planting out in their flowering quarters of plants propagated from seeds, cuttings, or divisions, bulbs and corms of summer blooming subjects, as Gladiolus, Amaryllis, etc., and towards end of the month sowing seeds of annuals that would be killed by frosts if sown earlier.

Pests.

Careful observation will be necessary to keep the young tender growth of the various plants free from attack by insects or fungi, and from such enemies as slugs and snails. An occasional dusting of quick lime, *i.e.*, lime newly slaked, to spots where slugs and snails are known to shelter, will tend to hold these pests in check. Aphis and mildew on roses and other plants must be promptly attacked, and persevered with if necessary, or the results from the plants will be disappointing the whole season through

The Dutch Hoe

should be going on the beds and borders, primarily to hold weeds in check, and also to prevent the baking of the surface and to allow air and moisture.

Pruning.

Plants that havo been pruned severely during the winter will usually develop buds so situated that the resulting growths are sure to crowd and exhaust the shoots that the pruner had aimed to specially encourage. Such buds should be removed as soon as they appear, and any abnormally strong shoots that would tend to destroy the symmetry of the specimen should also be either removed or pinched, except where required for exhibition.

Carnations

will need some attention at this season of the year, if the best possible results are desired, from a decorative point of view. Where an excessive number of shoots are present on old plants, these should be thinned out, leaving about six well placed leaders; also remove some of the weakly laterals, or side growths on the selected shoots, retaining those that are strongest and occur nearest to the base of the plants. The plants should be staked or supported, as being of a brittle nature they are likely to suffer from the effect of wind. The best method is to make a circle of wire netting, about 18 inches or 2 feet in height, and of sufficient diameter to enable the whole of the plant to be trained within it. A stake should be threaded through the ends of the netting to make the circle, and another at the opposite side, and each stake securely fixed in the soil. This is the best means of support for the flower shoots, and is also a barrier against rabbits, which, if present, will attack carnations in preference to any other plant. An occasional watering with liquid manure made from guano or some such manure and soot, will benefit the plants greatly, adding to the size and number of the blooms. Soot is a valuable material to a carnation grower, as, in addition to its value as a manure, it keeps mealy bugs and other plants from attacking plants. A new variety, largely exhibited in Melbourne last season by a Geelong grower, is of exceptioual merit. It is a tree carnation named Miss Jessie Moodie, and in color is white, heavily margined with carmine.

The Bouvardia

is one of the most useful dwarf plants for border decoration or for cutting, blooming freely during summer and autumn. The original types (natives oi Central America), of which B. leiantha, splendens, and triphylla are still found in many gardens were almost all red flowered; but garden hybrids have been produced much superior to those in form and size, and varied in colour. They are specially suitable for small gardens, but should not be planted close to large shrubs or trees. A loamy soil suits them well, and with a fair supply of water during dry hot weather they are sure to give satisfaction. The plants will be cut back by frost in winter unless sheltered, but will break away into growth again in the spring. Desirable kinds are

B. Humboldtii corymbiflora and
Beauty of Rrisbane, white
President Cleveland, scarlet
Bockii and Priory Beauty, pink
These are single-flowered varieties.

Of the double-flowered
Alfred Neuner, white
President Garfield, pink
Hogarth fl. pl., scarlet, and
Luteola plena, are the best.

Cannas

have been greatly improved during the last few years, and are most effective in mixed borders, their tall massive foliage of varying tints of green and metallic red affording a pleasing contrast to the surrounding shrubs and plants. They require a well-enriched soil, with, if possible, a warm, but sheltered aspect and plenty of water in summer. There are two types in the lately introduced varieties, one specially tall in growth, with large flowers, is styled the orchid flowering; another, of dwarf and more floriferous habit, the Gladioll-flowering. Among the best are—Alemannia, Suevia, Pandora, La France, Italia, Koningen Charlotte, Emilie Lorenz, and Alice Guilfoyle.

Chrysanthemums,

for border decoration, may be plranted from now till the end of October, but if large clumps are desired early planting is advisable. A number of varieties that are very fine when grown for exhibition are indifferent for decorative purposes. Suitable varieties are—Lilian B. Bird, Nellie Pockett. W. H. Lincoln, Convention, G. W Childs, Lady Roberts, Mermaid, William Tricker, Mrs. H. Cannell, Western King, and Goldmine. These are all Japanese varieties, varying in color, form and period of blooming.

Mr F. F. Clement, seedsman, 229 Rundle-street east, directs special attention to his selection of amber cane lucerne. Essex rape Globe and long red mangold and paspalum seed. In the lines of bone dust, bone super ammonia, shell grit, oyster shells, bone meal and chick meal, the quality of this firm's goods are well-known to farmers and gardeners

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Planning, Forming,
AND
Maintaining Small Gardens.

BY C. BOGUE-LUFFMANN.

In the economy of nature there are no fallows.

NEARLY all Australian work falls under the title of villa gardening, since architectural features are rare in the domain.

We are not really engaged in encouraging horticulture or gardening for the pure love of doing so. We want neat, attractive and satisfying home surroundings at the least expenditure of personal energy and capital. This confines us to purely domestic gardening, and what follows on this subject comes as near to what we may and ought to do as can be conceived.

Small gardens vary greatly in design and requirements, according as they surround villas, cottages, or country homesteads.

It must ever be accounted wrong to lay out in a stiff and formal style land which surrounds small houses, or such as are destitute of architectural beauty.

The money and labor available; the size, shape and position; the form of house, nature of surroundings; and the owner's special wants in the form of fruits, vegetables and flowers, will determine the plan. Design the garden as a whole, be it never so small: it will then be possible to keep it strong and beautfull in every part at all seasons of the year.

The garden must be clean, orderly, and beautiful. Where these features are wanting, we know that the plan is wrong, or that the absence of any plan and solid foundation work provides the disorder. The garden area is not, as so many imagine, assigned to houses in order to add to the troubles and responsibilities of their inmates, but to increase their means, knowledge, health and happiness.

The true gardener considers the house and its occupants. All else is vanity, since loving and cultivating flowers never so well may leave the garden a stupid and unsightly thing. The most difficult task is set the small gardener where the house is a kind of square barn with windows in it, placed on perfectly flat land, and destitute of any background or foreground worthy the name.

The undulating character of the city and suburban sites provides for very effective gardening on a small scale; but in many country places the task becomes extremely difficult unless plenty of trees are at command.

The universal want is more true soil. To its scarcity is due the rapid decline of most plants and the wasted and blighted character of the garden during summer. Therefore we should plan and strive most of all to obtain an abundance of soil. It is well to spend about ninety per cent. of the money available in getting and preparing material. Should the soil be rich and abundant, the principal outlay will be in the direction of draining and sweetening, and in creating a fine surface form.

For a guiding principle, make no shapes or lines which are not more or less common in nature, for where streets, buildings, and the ding-dong of city life provide so much that is artificial and discomforting, we should find in our gardens a short cut back to nature and rest.

Architects and builders often put entrance gates in wholly unsuitable positions from a gardening point of view, and, as there is no law to prevent one moving his gate, he may sometimes do so with very fine results. For example, if a small square piece of land fronts a house, a path running through its centre makes two insignicant and monotonous little patches. Privacy is lost, and trumpery borders and cockney devices become excusable. But if the small garden is lumped there is room for variety, and far less expense is involved in both making and maintenance. There is little meaning and less beauty in the average garden path. It runs where no one need walk. It wastes space, and wearies the eye with its hard monotony. It picks up the sun's heat, and thereby dries out the adjacent soil. It is, in short, a stupid, blighting thing, and, considering that it is a creation of man's, it says little for his common sense in local gardening.

Now it must be repeated that we never desire to dwarf a garden area: hence the small garden must be a correctly balanced piece of work. The entrance gate shonld be as far away from main door as possible, so as to provide for solid and varied features between these important points. Paths are needed only to reach various doors, gates and detached buildings. By way of confining them to their proper limits, it may be stated that the extent of paths in a small garden should not exceed its length and breadth.

The number and courses of the paths decide the plan of the small garden. The proportion of the surface covered with turf, shrubs and beds or borders of flowers will be governed chiefly by aspect and the quality of the soil. With rich, deep soil it will be possible to have more strength and variety than where the surface material is thin and the aspect hot and exposed.

Weakness in the soil must always weaken the plan, whereas none but a strong and liberal little scene will be sufficient.

Similar to large gardens, all the rough native material has to be graded and balanced between the various points, so that easy and graceful levels are produced. Adjacent houses, the surrounding walls or fences, or neighboring trees, may overawe and afford protection to or in some measure affect the quality of part of the small garden, so that it may be most appropriately used for a shady section, or for the growing of a group of plants, which will thrive in a dark and dank soil.

On the other hand, there may be a quarter containing clay or rock running near the surface and no means to cover with good soil, and at the same time preserve good form. Under such conditions, rocks or stumps may be used, but as a rule only where a solid background exists, since rocks look painfully weak and unnatural where they form cones or heaps amidst turf or artificially formed beds. For supports to house foundations or walls, masses at the approach to steps, or any pronounced alteration of level, rocks and roots may be used with lasting effect.

Water is too scarce or expensive to be much employed in small gardens: but it is possible to create tiny pools—the merest basins, of two or three feet in diameter—by digging small holes and puddling their sides with clay. The main point is to have water only where it will harmonise with and be of real service to its surroundings. Water requires to be in the shady quarter, where a broken light and variation in the levels will produce a natural looking position for something resembliug a little pool or stream. Quite frequently the ordinary surface drainage may be conducted to a point by a winding course which can throughout its length be clothed with more or less aquatic vegetation, thus producing a beautiful little gully or glade, and terminating in the basin. If a seat or arbor can be placed here the scene will be perfect. The defect of summer houses in ordinary is their uselessness, since they are placed in such defective positions as to make it impossible for one to rest and gather refreshment in them. The summer or garden house, or arbor, or covered way, must be so placed and built as to provide very pleasant prospects.

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The Rose.

(BY A. H. SCARFE.)

MR A. H. SCARFE is admittedly one of the best authorities upon the cultivation of the rose in South Australia. This gentleman recently delivered an address upon the subject at the School of Mines, and we extract the following from the report of the Register:—

Soil and Situation.

The choice of soil and situation as regards most of us is, I apprehend, beyond our control. We have established our homes, and therefore have to adapt ourselves to existing circumstances. All rose experts, however, agree that roses should be planted in an open position and yet sheltered from strong winds by hedges, trellises or belts of trees, care being taken that the roots of any trees or shrubs are not allowed to interfere with the flower borders. Roses can be grown where the soil is comparatively poor, because this can have quality given to it by judicious cultivation; but roses cannot be grown to perfection unless they can have the ground to themselves. Some enthusiasts, finding themselves located amongst the most unpromising surroundings, would not be deterred from trying to form a garden. Certain conditions we cannot alter—climate, for example—but soil can be prepared by expense and labor, and is very often done. Dean Hole relates—'A gardener remarked to a friend of mine who had won a first prize for roses, 'I believe, sir, that you have got the only rose garden in Lincolnshire which could grow such blooms.' 'And I brought it there,' my friend responded, 'in a wheelbarrow.'

Mr Edward Mawley,

one of the best authorities in Great Britain, says—The best site for roses is an open yet sheltered one, though as little shut in by trees or buildings as may be. On the other hand, it must not be too much exposed, for although roses delight in a free atmosphere they have a great objection to be frequently swept by high winds. Shelter from the north and east is most necessary, but exposure to strong winds from almost any quarter is undesirable. Bearing these facts in mind the position best complying with them should be chosen, and if necessary a high hedge or belt of trees planted on the side where shelter is most needed. Care must, however, be taken that this hedge of tree belt is sufficiently distant from the roses to prevent the possibility of its roots finding their way at some future time into the rose beds. Wherever it is possible roses should be allowed a separate bed or beds to themselves, and not be planted with other flowers.

Rev. Foster Melliar

says—Exposure to strong winds is very hurtful to roses in the flowering season, and at such a time an exhibitor will be more distressed to be awoke at night by a gale of wind than by a storm of rain. Anything that rubs or chafes against a petal will injure and spoil it; and to tie every bud up so that nothing can possibly touch it is among a large number almost an impossibility. Strong winds are so injurious that shelter should be sought for, and that not only on the north and east, but also on the south-west, from which the strong winds usually come from. Belts of close-growing trees or thick and tall hedges will be the sort of hedges usually available, but it is most important that they be not close enough, either to shade the roses or for their roots to enter the beds.

Hints about Shelter.

Buildings or walls are the best shelters, as the protection they give is real, with some refracted warmth; they drop no seeds or leaves and especially they have no robbing roots. Apart from walls or tenements, the question of shelter is a difficult one: for it must be carefully remembered that the vicinity of trees, shrubs or hedges whose roots can reach the beds, and also all actual shade should be sedulously avoided. Then, again, the situation must be quite free and open, not close and stuffy; and if no shelter whatever can be had, the finest nurserymen, even those who are most successful at the shows, are absolutely open and exposed to the four winds of heaven. After all it is better to be moderately high and exposed than to be too sheltered and too low, particularly if the shelter consist of growing trees and shrubs which stand too close; but if thus unsheltered, extra and constant care must be bestowed in the growing season to tying and supporting. The majority of the H.Ps should be grown as dwarfs, and stout bamboo stakes should support the standards. In many cases, however, the would-be grower of roses has no choice of a situation, but has to make the best use of the land at his disposal.

Dean Hole

expresses himself as follows—The rosarium must be both exposed and sheltered, a place of sunshine and shade. The centre must be clear and open, around it the protecting screen. It must be a fold wherein the sun shines warmly on the sheep and the wind is tempered to the shorn lamb; a haven in which the soft breeze flutters the sail, but over which the tempest roars, and against whose piers the billow hurls itself in vain. And this may, I think, be taken consequently as a golden rule in the formation of a rose garden. So lay it out that a large proportion of your trees may have the sunshine on them from its rise to the meridian, and after that time be in shadow and in repose. To effect this the garden must extend in longitude from north to south rather than from east to west—the form being oblong or semicircular. The west wall or fence should be from 8 to 10 ft: the northern tall and dense, but not necessarily so high as the western; the eastern such as will keep out cold, cutting winds, but not one ray of sunshine—say 5 ft. To the south the rosary may be open; but even then, so hurtful here is a rough wind, which occasionally blows from this quarter, that I prefer some slight protective screen, such as a low bank or bed.

Soil and Manures.

Mr E. Mawley

writes—A deep, strong loam is the best land for roses, land on which an exceptionally excellent crop of wheat could be raised. But as this ideal soil for a rose garden is seldom to be found ready to hand, an endeavor must be made to supply the soil with those ingredients and physical qualities in which it is most deficient. For instance, should it be a stiff clay it must, if necessary, be drained. If not so retentive as to require it, a liberal quantity of burnt earth and long stable manure, sand, etc., must be incorporated with it. If, on the other hand, the soil be too light and porous, some heavier loam should be mixed with it, and cow, instead of stable manure introduced. If, on examination of the soil, it be found not only porous, but also shallow, some of the chalk, gravel or sand beneath must be entirely removed and replaced by heavier soil, not absolutely clay, obtainable in the vicinity.

Pillar Roses in Mr Scarfe's Garden

THE REV. FOSTER MELLIAR

says—If there was a choice, I should select rather the best loam with a tendency to clay, what a farmer would call strong land. The soil should be equally good for quite two feet in depth, with effective natural or artificial drainage as a sine qua non. By natural drainage I mean a subsoil of gravel, stone, sand or chalk, and for artificial nothing less than actual pipes should be used, laid by a competent man, with a fair fall, and outfalls not neglected, but watched, cleared and properly attended to. Soil known as gravelly is often too quickly condemned. It is considered healthy to live on, agreeable to work and useful for many purposes, but too hot, poor and dry for the cultivation of the best roses; still, as I have had to grow most of my own in such medium, condemned after careful examination by one of the best judges as hopeless, I can aver that there is no reason to despair of a gravel soil. There will be some soil at least light and dry, and powdery, perhaps, but fairly fertile on the top above the gravel, and this probably the full depth of the spade in the garden, but not so deep in the field, should be taken out and laid on one side. Though not the soil the rose delights in, it is excellent for root formation, for the striking of cuttings, for placing next to the roots of roses, and for mixing with heavy loam or clay in the making up of the beds. The actual gravel must then be taken clean away to the depth of two feet at least from the surface (some enthusiasts say three feet, but I do not think it necessary or even desirable), and sufficient good strong loam procured to take its place. This is expensive, but is absolutely necessary for the production of fine H.P's, and will last a long time. The main part of this heavy loam should be placed at the bottom where the gravel was, but a little of the light soil may be mixed with the upper portion. It is important to notice that when beds are thus made up of rose material in what is naturally a gravel soil, the advantage is obtained of such perfect natural drainage at the sides as well as at the bottom of the beds as could not well be attained in what is by nature a good rose soil. Furthermore, tea roses may be grown to perfection on gravel soil. A plentiful quantity of good manure should in this case take the place of the poorest of the gravel both above and below the rose roots, and a little of the heavy loam may be added though I do not believe it to be necessary. For teas there is no occasion to be afraid of the multitude of small stones which are natural to a gravel soil, for I believe that Mr Geo. Paul was right when he stated in the Rosarian's Year Book that tea roses like grit.

MR WM. PAUL

states his opinion on soils and manures as follows—Almost any soil will produce roses provided a proper selection of varieties be made and attention bestowed on the application of suitable manures. Of course, roses enjoy a rich soil, but to keep adding cow, horse, and pig manures upon naturally rich land is not so beneficial as a change to nitrate of soda in the case of light soils, or soot for those that are naturally very close and stiff. This subject therefore is more a question of judicious manuring than selection. The golden rule is to add what the land is most deficient in, and never to apply close moisture retaining manures to a soil that is naturally stiff and moist. A very dry and sandy compost may easily be made suitable by the addition of a few loads of stiff loam and clay, also by manuring with pig manure, while, in the opposite plan, a stiff, poor soil may be worked into equally good condition. The ideal material is fairly stiff, not too wet, and not less than three to four feet in depth. This can be enriched at will.

WALTER P. WRIGHT,

editor of The Gardener, says on this point—All soils will not grow roses equally well, but most kinds may be made to yield satisfactory results. There is comfort in this dictum. In particular it cheers the heart of the man who has heard so much about clay for roses and has no clay within a hundred miles of him. The important essential is cultivation, the soil trenched, tumbled and manured, trees well planted and pruned. The best soil requires to be well prepared—that is, broken up to a depth of at least two feet, a good dressing of stable manure incorporated with the bottom spit if heavy soil, cow manure if light; and unless the top soil is particularly good a sprinkling of bonedust well worked in will be found beneficial. Light soils will be improved by the addition of that of a heavier texture: heavy soils are much improved by the admixture of road scrapings, wood ashes or leaf mould. Roses enjoy soils which are retentive of moisture rather than otherwise, but like nearly all other plants will not thrive in those which do not allow the rain to pass readily away from their roots. Therefore, where the soil or subsoil is waterlogged, the land should be properly drained before the planting of roses is attempted.'

In this climate we do not suffer from an excess of moisture, and artificial drainage is not so necessary. Still there are localities where it is desirable. Where the expense can be incurred, all land, however well drained naturally, can be much improved by subsoil drainage, which has the effect of keeping the ground moist, and assists to aerate and keep it open. The authorities from whom I have already quoted are in favor of good farmyard manure being the most suitable to use, either for incorporating with the soil when the land is being prepared or used in the spring and summer as a mulch, and very little is said as to the employment of artificial fertilisers.

MR HALSTEAD,

a noted rosarian of New South Wales, gives the benefit of his experience as follows—I have acted upon his advice to advantage, and have therefore no hesitation in recommending it.

Natural and Artificial Manures.

Natural manures—horse, cow, &c.—will always rank as the best for roses. For mulching they are invaluable, and when dug into rose beds they increase the supply of humus (vegetable matter) in the soil. Humus is a most important factor of the soil in a dry climate, because not only does it supply food for the plants, but it generally increases the water-holding power of the soil.

Horse manure is particularly suitable for incorporation with heavy or clay soils and for mulching; it may be used freely in both cases.

Cow manure is more suitable for light, loamy and sandy soils, but it should be allowed to rot in a heap for a month or two before being used.

Liquid Manure is the most valuable of all manures for the exhibitor, as it can be applied in the early spring and autumn, when it is most wanted to force on the young flower buds; and, being in liquid form, the roots are able to assimilate it at once. It may be made of fresh cow manure soaked in water for a few hours, or cow or horse manure and nightsoil may be mixed into a thick paste in a cask, and allowed to stand for a few weeks. Take half a dipper of the latter to a bucket of water for each strong growing plant. Young and weak plants require less of the manure and more water. Liquid manure is best applied after rain. In very dry seasons it should not be so strong, but should be used more frequently.

Artificial manures should only be used in conjunction with natural manures, and not in lieu of them, as they do not supply humus to the soil. It is most important to supply an artificial manure, which contains soluble minerals of such kinds and in such proportions as will provide the proper food a rose requires. These minerals have been discovered by analysing the ashes of the various parts of the plant, and it has been proved that they with the addition of nitrogen are the things of which the plant is made, and therefore supply the proper food. Those who wish to study more fully the question of good manures cannot do better than read what Dean Hole and the Rev. Foster Melliar have written on the subject, as in The Book about Roses and The Book of The Rose it is exhaustively treated.

Preparation of Beds.

Now, in order to carry out proper cultivation and to ensure the best results, roses must be planted in beds by themselves. Although there are, and always will be, a large number of cultivators whose roses are growing in mixed borders among strong herbaceous plants and shrubs it must be said that it is next to impossible to grow roses to perfection under such conditions. There is no plant that is more impatient of interference with its roots than the rose, so that I strongly advocate if possible, the setting aside of a strip of land which can be devoted exclusively to this purpose. Of course if you want to economise

Roses on Trellis in Malvern Garden

the ground and produce a handsome display of bloom in the way of annuals among your roses you can do it, but the queen of flowers will suffer, and I am speaking now of the plan to adopt for securing the best results. Beds may be arranged in shape and size according to one's taste, or in such a way as surroundings will admit of. Longitudinal beds, however, are the most convenient, as providing facilities for inspecting the plants, and permitting of the land being easily cultivated from either side without the necessity of treading upon it. A convenient width is 4 or 5 ft, which permits of two rows of plants. If these are of dwarf habit 2 ft 6 in apart will give ample room—but for more vigorous growing qualities—Maman Cochet, for example —3 or 4 ft is not too much—you must remember, however, that where space is limited a vigorous growing plant can always be kept within a moderate compass for pruning. To break the formal character of beds such as these pillar roses, or pegged down roses, may be planted in the centre at intervals. The beds, whatever may be the shape decided on, should be properly trenched to a depth of at least 2 ft, a good dressing of manure being incorporated with the bottom spit, which should not be brought to the top. In preparing the land, if you employ labor, see that it is done properly. Have a reliable man to do the work who will obey instructions. Paths should of course be sufficiently wide to admit of the use of a wheelbarrow without damaging the plants.

W. Paul's

advice as to the preparation of rose beds is—Too much care cannot be devoted to these, whether they be in the garden or elsewhere, for the future success of the plants depends upon this being properly done. If the soil be a good deep loam it should be well trenched, and a liberal dressing of farmyard manure and half-inch bones incorporated with it. Poor and light soils will be much improved by the addition of some turfy loam, as well as the manure and bones. Heavy land, if the subsoil be retentive, will require draining in the first instance, for although roses are very partial to a cool and moist bottom, they, like most other plants, will not thrive in that which is waterlogged ; but should the soil be stiff, and yet not so clayey as to require draining, the beds will be much improved if some burnt earth be mixed with it, as this will serve to keep the land porous and aerated. For this class of soil horse manure is preferable to either farmyard or cow manure. Let the beds be ready, if possible, by the end of the summer, so that the autumn rains may have a chance of settling the soil in them before the planting time arrives.

In the Book of the Rose

the author says—For me, beds must be made for the rose, and the rose alone. No mignonette or other annuals to hide the bare ground, since standards need not be more than 2 feet high in stem, and dwarfs should be close enough to do all the ground hiding required. Let there be rosebeds sacred to the rose, and let them all be grown together in the very best situation to be found, for standards dotted about singly here and there by the side of the drive or in holes on the lawn are much more difficult to manage and care for properly than if they were all together in prepared land. It is well known that you can feed 100 people much better and cheaper in proportion than you can one person. And so, if the rose is in a big bed with many others, the food can be applied with greater economy and effect, and the roots can find in any direction the same congenial proper soil and nourishment. Let the 'small man,' if he be a true rose lover and has a mind to produce them really well, harden his heart against all rival flowers, and go in practically for roses alone. In every department in life a man has to be a specialist now if he wants to succeed, and the rose will amply repay special devoted care. There are several examples among amateur rosegrowers of singlehanded men who either unceasingly superintend or do all the work with their own hands ; and most of these have not the smallest fear of meeting the best head gardeners in England in any class of the largest shows. This is by no means the fault of the head gardeners, even of such as have fifty men under them, but is simply because the rose requires undivided care through nearly the whole of the year, and they have such a multitude of other things to attend to that they cannot compete even with a singlehanded man who gives all his time to his roses.

As to the shape of beds, it seems evident that they should not be so wide as to necessitate treading upon the soil to reach and cut the blooms. This points to long and comparatively narrow beds, and when you have them there seems no escape from actual rows, following the shape of the beds, where straight or curved. Anything else would waste the precious room, for if the whole bed be made of the best soil and fed and manured equally, the room that will hold another plant is precious. Straight rows may be condemned as formal, and so they are ; but they are thoroughly practical and economical, and undoutedly the best for an exhibitor, who wants to be able to go over all his plants easily and expeditiously.

The Orchard.

Operations for October.

BY JAMES LANG.

PRUNING and planting operations should now be concluded, and a start made with the ploughing of the orchard. Although the winter has been unusually damp and moist, with an abnormal number of wet days, no excessive quaniity of rain has fallen, and the land is now in splendid condition for working. As the days are drawing out, and drying winds are being experienced, moisture will soon evaporate from the soil, and it is therefore necessary, especially in the early districts, that ploughihg should be started as soon as possible in order to finish it in good time.

Where it is intended to apply fertilisers to the orchard it should be done before ploughing. Some of the special orchard manures now upon the market should be used. These manures contain all the necessary ingredients for the production of fruit, and form a complete manure.

Old trees may now be headed back and regrafted with varieties more suitable to market requirements. Great consideration should be given to to those varieties that do well in the different districts and are suitable for export. Growers now will have to depend more and more every year on the export to oversea market if the export is to be placed on a profitable basis, and they should, therefore, study those export varieties that succeed well in their orchard, and gradually clear out the varieties that have become unprofitable. By this means they will in time put their orchard on a better commercial basis than they have hitherto done. It is also a good plan to rub the top of the stock with paint or tar to exclude the wet ; if this is not done the surface of the stock soon commences to decay, and gradually the whole of the stock rots away.

Should moist weather continue the scab on apple and pear trees is likely to cause a deal of trouble in those districts where it has been prevalent. Spraying with the Bordeaux mixture will have to be resorted to as soon as possible. Apricots that are attacked with shothole fungus should also be sprayed when the buds are bursting into leaf. Peach trees also will require attention for the Aphis, and should curl in the leaf make its appearance spray at once.

W. J. ALLEN.

In most of the drier districts it is best to see that all green crops are turned under this month, in order that they may become well rotted while there is still considerable moisture in the soil. If such crops are allowed to remain in until the land becomes dry it will be found almost impossible to plough the soil, to say nothing of turning them under, and the chances are that in place of doing good the opposite effect will result, as the moisture in place of being conserved will have been taken up by the crop, in consequence of which the soil will have become hardened, and when ploughing is attempted the ground will break apart in lumps and it will be found impossible to turn the crop under, which will thus dry up instead of rotting as it should. If rain should not fall it will be found almost impossible to bring the land to a proper tilth, and owing to the absence of moisture in the soil the trees will in all probability suffer severely during the summer months, and the fruit will be of little value as it will be undersized and flavorless. Therefore in all dry climates see that crops intended for turning under as a green manure are not allowed to stand to long before being ploughed under. In our coastal districts, where rains are of frequent occurrence, there is not the same probability of dry weather overtaking the fruitgrower, consequently he can take more risks than can his brother in the interior. If the spring proves to be a wet one it is advisable to spray any trees which have in previous wet years shown signs of fungus diseases, such as Peach Curl on the peach tree, Black Spot or Scab of the apple, Black Spot of the grape vine, and growers of the Gordo Blanco and Sultana will have to keep a sharp lookout and keep the spray pump going, else the crops will be lost. Bordeaux mixture is the best spray at this time of the year for all fungus diseases. Should the San Jose scale put in an appearance after the leaves have started on the tree, the resin, soda and fish oil wash will be found the best to use at this season of the year. Never spray any trees or vines while they are in bloom, else the chances are the crop will be destroyed. They may be sprayed a week before coming into bloom and seven days after the bloom is set.

Citrus trees may be pruned this month, and there are many orchards which would be greatly benefited by receiving a thorough pruning. Do not allow the lemon trees to grow high and willowy, but rather remove those tall weak limbs which are so often found growing up through the tops of the lemon trees, and keep the tree lower, when it will be found much easier to spray, fumigate, and pick the fruit from it. Oranges and mandarins are generally benefited by a cleaning out from the centre of all superfluous and worthless limbs, twigs, etc.

In every case, see that the orchard is in thorough condition in every respect, as the future crop depends so much on the condition in which the trees and soil are kept during the spring and summer months. See to it, therefore, that no blame can attach to you if they do not make a good start.

Vegetable Garden

Operations for October.

W. S. CAMABELL.

OF the tender kinds of vegetables, which it is very desirable to grow as early as possible, and afterwards through the summer, the Kidney or French bean, the Lima and the Snake bean, and the Scarlet Runner are amongst the most important. The tomato, too, ranks very high in general estimation. In the warmest parts of the State, tomatoes should be in bearing by this time. Where frosts have not been felt, old tomato plants have survived and are bearing fruit again, and fresh plants have progressed well.

Asparagus—Plant this at any time during the month; but if the necessary plants are ready and to hand, they had better be set out as soon as possible, and then they are over and done with for years.

Bean: French or Kidney—Sow a row or two twice or three times during the month in drills about 2 ft 6 in or 3 ft apart for the dwarf varieties, and about 4 ft or more apart for the runners. Sow the seeds about 4 inches deep in the rows, and about 5 inches apart. One of the very best of the dwarf growing varieties is the Canadian Wonder, which has held its own against many new comers for years.

Mr Ellis, superintendent Howlong Viticultural Nursery, tried some new climbing runner bean seeds last season. Of Sutton's Princess of Wales he reports — This is an entirely new variety of climbing bean, of the highest merit and a splendid bearer. The trials made have proved it to be one of the best; its pods are from 7 to 10 inches in length, fleshy and tender, and in appearance somewhat similar to a well-grown Canadian Wonder; it is a great acquisition and is sure to become a favorite. Height, 4 ft. Seed, brown in color.

Climbing French bean, Sutton's Tender and True—A first-class French bean in every respect, somewhat similar to the above, fleshy and tender. Seed, vermillion in color.

Climbing French—Sutton's Earliest of all—Good type of climbing bean, very early, and an early bearer; height, 4 ft. Seed, white.

Runner Bean—Sutton's Abundance—Tall runner bean of high merit, a sturdy grower and a good cropper. Pods are long, fleshy and tender, 8 to 13 inches in length and 1 inch in breadth. Stands the heat well, is a fine show variety and a great acquisition. Seed white.

Runner Bean—Sutton's Epicure—First-class climber and heavy bearer; very fleshy pods. Only slightly affected by the extreme heat of the past summer. Very distinct: quality not tested. Seed brown.

Scarlet Runners—Sutton's A1, Best of All—Seed speckled—Three types of first-class runner beans have evidently been selected from stock of the highest grade, in fact they are so good that it is almost impossible to say which is the best. They are all heavy bearers, and deserve a place in every garden.

Runner Bean—Sutton's Tall Sugar—Good climber; very prolific and stands the heat well. Quality not tested. Seed white.

Dwarf French—Sutton's Perfection—Very early variety, and an enormous bearer. Very fleshy and of good quality. Seed, speckled.

Dwarf French—Sutton's Plentiful—Sturdy grower and an enormous bearer of good quality. It is almost sure to become a favorite with market and also private growers whose land space is limited. This variety and Perfection are two of the heaviest bearers in cultivation Several of the plants grown here broke down with the weight of the crop. Seed, light brown.

Dwarf French—Sutton's Monster Negro—Although not such a heavy bearer as the above, it is one of the very best for private growers, or with those with whom high quality is the main object. It is a very robust grower, and the pods are long, very fleshy and of excellent flavor. The plants require to be grown from 10 to 12 inches apart. Seed, black.

Dwarf French—Sutton's Triumph—To all appearances a very good variety. Quality not tested. Seed brown.

Bean, Lima—Sow in all warm localities, or wherever there are not likely to be any late frosts. King of the Garden is a good variety.

Beet, Red—Sow seed about 1 inch deep, in drills about 18 inches apart, from time to time during the month. Thin out seedlings well as soon as they have made two or three leaves. The beets thinned out may be planted in another bed, but they must be taken up carefully.

Beet, Silver—This is one of the best vegetables for summer. Sow a little seed in a seed bed, and transplant when the seedlings are large enough to shift. Not many plants are likely to be required

Cabbage—Sow a little seed from time to time and only sufficient to produce enough plants for small plantings. It is better to plant out small quantities occasionally than a large batch at one time. Make the soil very rich, with good rich manure, not too rank, and cultivate between the rows frequently. Frequent cultivation will do an immense amount of good to the cabbage, the cauliflower and all the rest of this kind of plants.

Cauliflower—In the cool districts plant seedlings or plants that have been picked out, and keep them growing without check from start to finish.

Carrots—Sow a few rows, in drills from 1 to 18 inches apart: cover the seed very lightly with fine soil.

Celery—Sow a little seed in box or small seed bed, and plant out good sized seedlings which may be ready; manure well and plant in shallow trenches. It is a waste of time and quite unnecessary to dig out deep trenches for celery, for it can be managed just as well, if not better, certainly much easier, when planted in very shallow trenches, and it is only necessary to make even shallow trenches to allow of the plants being easily watered, or for the application of liquid manure. Try the best of the self-blanching varieties, and these can be completely blanched with but little trouble.

Choco—Some vegetable growers like this vegetable, which grows somewhat like a pumpkin or cucumber, but needs trailing up wire-netting or fence, or some good support to enable it to grow to the best advantage.

Cucumber—Seed may be sown extensively in all warm localities. Young plants raised for the purpose may be planted out, and they will soon make progress. Manure the soil well before sowing or planting. As the veins extend, pinch the ends, and this will induce growth of laterals.

Endive—Sow a little seed, and plant out any seedlings that are large enough to handle, just as you would lettuce.

Leek—Sow a little seed from time to time, and plant out from previous sowings. Sometimes if the weather is very dry lettuce is difficult to grow in the summer. To obtain the best results it should be grown without a check by the use of abundance of water and a quantity of liquid manure.

Melons—Rock and Water—Sow seed in all warm localities as extensively as may be required.

Okra—Sow a little seed in warm places, and afterwards transplant the seedlings to land that is well manured. They should stand about 2 feet apart. This plant is sometimes made use of for ornamental purposes in the flower garden, for it is very pretty when in full bloom.

Onions—Be sure to grow some onions, for they are very useful indeed, and if good keeping kinds, such as the brown Spanish be produced, a supply can be kept for a considerable time in the house. At the present time onions are almost unobtainable and the price is terrible. If onions have already been raised in a seed bed they should be transplanted out without delay. The soil should be made rich and surface fine where seed is to be sown.

Parsnip—Sow a few seeds in well-dug land. The digging, or trenching, which would be preferrable, for the parsnip is a deep rooting plant, and needs the soil to be well worked, especially if the soil below the surface, is at all stiff.

Peas—Sow a row or two from time to time during the month.

Pepper or Capsicum—Sow seeds in a warm spot and plant out seedlings when large enough. If plants have already been raised plant out in all warm localities. Probably one or two plants will suffice for a family.

Rhubarb—Plant out early in the month and obtain some of the winter varieties, in addition to the summer kinds. If plants for future use are likely to be required, sow a little seed and in a year or two these should be quite large enough for planting out.

Tomato—Sow seed in the open ground in all the warm districts of the State. Already in the warmest parts tomatoes are growing satisfactorily, and will soon be producing flowers and fruit. At the Wollongbar Experimental Farm, Richmond River, the gardener, Mr King, tested several varieties of tomatoes for me. He found Dwarf Champion to be an excellent one, and well worth growing. The older and well-known Matchless he found to be wonderfully good in the district as it seems to be in other places. This tomato Mr King considers to be one of the best to grow. For his tomatoes he applies liquid manures three times a week twice with sulphate of potash, half ounce to the gallon of water and once with nitrate of soda, one ounce to the gallon of water.

Turnip—Sow a few seeds from time to time.

Vegetable Marrow — Sow in same way as advised for pumpkin.

The S.A. Horticultural and Floricultural Society's annual Rose Show takes place in the Adelaide Town Hall on Thursday, October 26. This will be the first exhibition of the season of Flowers, Fruit and Vegetables, and it is anticipated that the number of entries will beat the record. Send for list of prizes to the hon. secretary, Mr W. Champion Hackett, Rundle-street.

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Poultry Breeds and Crosses.

The following suggestions as to suitable breeds and crosses for various purposes are given in a leaflet of the Department of Agricultural and Technical Instruction for Ireland :

LAYING OR NON-SITTING BREEDS.

(Production of eggs.)—Minorcas, Leghorns, Andalusians, Houdans. Characteristics.—Light-bodied birds, weighing from 5½ to 7½ lb. Active in habit; noted egg producers, but, generally, poor table birds. These breeds lay white-shelled eggs. They are known as "Non-Sitters," as the maternal instinct is not strongly developed, though broody specimens are not uncommon. Selection—White Leghorns and Black Minorcas are most recommended. All the above-mentioned breeds thrive upon light and gravelly soils. For a cold, exposed situation, or a clay soil, Leghorns should be selected. Minorcas, Andalusians and Houdans are best suited to medium or light soils and sheltered situations.

* * * *

GENERAL PURPOSE BREEDS.

(Winter layers)—Plymouth Rocks, Orpingtons, Wyandottes. Characteristics.—Large-bodied birds, weighing from 7 to 11 lb. These breeds are hardy, and combine both laying and table qualities. They are good winter layers, and all lay brown-shelled eggs; the hens make good sitters and mothers. Selection — Buff Orpingtons and Plymouth Rocks are most recommended. All the breeds thrive well upon light or gravelly soils. For cold, exposed situations and clay soils, Plymouth Rocks should be selected.

* * * *

TABLE BREEDS.

(Production of flesh), Dorkings, Indian Game, Faverolles. Characteristics,—Large-bodied birds weighing from 7 to 11 lb,, and possessing great development of flesh. All, with the exception of Faverolles, poor layers. Dorkings lay white, Game and Faverolles tinted eggs. For selection Dorking, Faverolles and Indian Game are most recommended. A bird of prime table quality should possess a large frame, combined with fineness of bone, scarcity of offal, a long deep breast, white flesh and skin and white legs and feet. The Indian Game, although not possessing all these qualities, is one of the best breeds for table purposes when crossed with white fleshed breeds such as Dorkings or Faverolles. The above-mentioned breeds, especially Dorking, thrive best upon medium or light soils. Birds of high-class table quality are difficult to produce on heavy clay soils.

* * * *

CROSSING.

Under special circumstances crossing is beneficial. If the birds are suitably mated, crossing tends to increase the size, vigor and hardiness of the offspring; this applies only to a first-cross, that is, a cross between two breeds. The object in view should first be studied, and two breeds selected whose characteristics and qualities when blended together will secure desired result. Indiscriminate crossing is positively injurious. To maintain a first cross and to avoid the necessity of breeding or purchasing new stock of both breeds every year, the following plan will be found most successful and economical. If, for example, it is desired to cross Houdans and Leghorns, and that the first mating be a cock of the former breed and the hens of the latter, the progeny will be half-bred. This method is continued year after year, simply using alternately a male bird of the two breeds originally employed. While cross bred pullets produced each year are kept as stock for the coming season, the cockerels are disposed of for killing. Under no circumstances must crossbred malebirds be used for stock purposes. In this simple manner the cross is confined to two breeds, and no expense except the yearly purchase of a male bird, is incurred after the initial outlay.

The following crosses are recommended—

For Egg Production.

Cock.		Hens.
Houdan	-	White Leghorn
Houdan	-	Black Minorca

For General Utility Purposes.

Cocks.	Hens.
White Leghorn	Plymouth Rock
White Leghorn	Bluff Orpington
Black Minorca	Plymouth Rock

All these crosses produce pullets of great vigor and prolificacy, and cockerels that can readily be disposed of for table purposes.

For Table Purposes.

Cocks.	Hens.
Indian Game	Dorking
Indian Game	Faverolle
Indian Game	Buff Orpington
Old English Game	Dorking

In order to secure the greatest possible return from common fowls of the country, it is necessary to raise them to the highest standard of perfection. This standard can only be attained by breeding from pure male birds, as they possess known good qualities and have the power of stamping such upon their progeny. Mongrel male birds lack these characteristics, and are, therefore, unsuitable for breeding purposes. By the use of mongrel or crossbred male birds it is quite impossible to grade up or improve common fowls. At the same time it would not alwaye be advisable to dispose of all mongrel hens because good results can be obtained from flocks of crossbred hens if they are mated with pure bred male birds of a type possessing the qualities desired in the offspring.

SELECTION AND BREEDING.

1. Breed with a definite object in view.

2. Avoid indiscriminate breeding. Breeding without selection leads to failure; therefore only breed from selected birds possessing the required qualities, and not from the entire flock. If possible, establish a select breeding pen, and ascertain that the birds chosen come from good strain, are perfectly healthy and possess straight breast bones. Deformed or crooked breasted fowl should never be used for breeding purposes. 3. Avoid in breeding. It causes deterioration in productiveness, and produces birds weak in constitution, which renders them more liable to deformity and disease. The introduction of new blood is important, and is best obtained by purchasing each year a fresh male bird of a good strain and unrelated to the hens with which he is to be mated. 4. Six to ten hens may be mated with each male bird, but no fixed rule can be laid down as the season of the year, the breed and the vigor of the cock are all determining factors. 5. Do not keep old hens. A hen for laying should not be kept after two and a half years of age. Each year all such hens should be sold off before they moult. Usually, the best price can be obtained in Britain in June or July, but a study of the local markets will be the best guide in this direction. Early hatched pullets should take the place of the old hens, and this necessitates the sale of half the stock annually. Such pullets should be marked by placing rings or bands round their legs. All hatched one year can be marked upon the right leg, and those hatched the following year upon the left. By this simple means the birds to be disposed of can easily be distinguished. 6. Hatch early to procure strong and healthy stock birds, and rear young birds apart from the general stock. At an early age separate the sexes. When not allowed to run together, both cockerels and pullets grow faster, and ultimately make better birds.

The Commercial College, Pirie street, Adelaide, is the only institution in this State which is headed by an Associate of the Institute of Accountants, or with one on its staff at all. The principal keeps in touch with business men, and places scores of young men and ladies in first class appointments annually. To ensure this success, the principal takes a continued personal interest in his duties, not leaving qualified students to shift for themselves. The principal delights to interview parents or anyone interested, and will furnish any information desired, as well as a prospectus, to anyone asking for same. Country residents will be glad to learn that they can obtain tuition by correspondence on all subjects, also typewriting, and can get particulars on writing to Mr Howard.

S. Marshall and Sons are doing a good trade on the time payment system in pianos and organs. A good instrument is always worth its money, so those who intend buying a piano or organ should purchase from a firm whose name is a guarantee of the quality of the goods sold.

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The Best Brooder.

BY G. W. COMINS.

I USED incubators for many years before I got a brooder, because I knew such as we had required unremitting attention, they had no regulators, and could only be kept right by constant watching, turning the lamp up or down as required day and night; the floor was flat, and if it got too hot in one place it was too hot everywhere, chicks are half smothered, drink to excess as soon as they get to water, then bowel complaint, and die. Knowing all this I gave the chicks to hens to rear. Now I know better. Anyone can make a brooder which should not cost more than 7s 6d under any circumstances (my last two cost only 1s 3d each), the price of the brooder lamp, chimney, and burner, which is the only thing a handy man cannot make, that must be bought. It is not necessary that everything should be either the shape or size I state, but I find it best as I put it. Get a packing case about 3 ft square, 2 feet 3 in deep, knock boards off top and bottom, nail four stout pieces in the corners to stiffen box, half way between the top of the box and the ground nail an inch batten, or any piece of board an inch thick, all round the inside of the box, on this nail the boards which were on the top of the box, making a board floor in the centre of the box. Out of the centre of this floor cut a round hole 9 inches in diameter, now turn box upside down and cut a sheet of galvanised iron (an old piece of corrugated with corrugations hammered out will do) exactly the size of the box, and drop it inside on the batten in the centre, leaving 1 in. space between the boards and the iron: now nail a batten round to hold the iron in its place, and be sure it is tight to prevent smoke from getting up between the iron floor and wooden floor, turn box over again and get a piece of iron or tin 5 inches wide, and nail it round the hole in the centre of the wooden floor, so that it stands up 4 inches above the wooden floor; bore four 1 inch augur holes or cut out with a chisel at each corner to let air in between the iron floor and the wooden floor, nail on the boards on top, all but the one next the back which leave loose for a door, also leave the top board at the back loose for a door for cleaning out, just hang these boards loesely by a piece of leather, cut a hole 10 in. x 8 in. in the centre of the top for a bit of glass to give chicks light, cut a door about 8in. wide and 4in. high in front for chicks to go out, and another about a foot wide from the bottom to the iron floor to put the lamp in and out, now get some thin boards (any sort will do), make a round hover about 20 in. across, nail a bit of warm stuff 4 in. wide round it, and cut up at an inch apart, put this hover on top of the round tin in centre of wooden floor, having three narrow strips on under side to allow free current of air to come up from between the iron and wooden floors, which strikes the hover (under which the chicks will be), spreads out into the box, and up and out at the loose door on top, and will have a brooder which never fails and is better than any you can buy. For a lamp take a kerosine can, cut 3½ in. off the bottom, 3 in. off the top, cut down the corners of the top piece so that you can force it into the bottom, turn down the edges on to the top to hold in position, cut a round hole 1 in. in the middle, get a brooder lamp chimney and burner from any wholesale firm, solder it on, and you have a lamp which will burn for a week without filling. I have made these directions as concise as possible, you can improve on them by using T. and G. boords for wooden floor to prevent sand, which must be on the floor, from shifting through; if you do not use T. and G., nail strips of tin along between the boards on the under side before putting the iron; the doors can be hung with piece of leather, and anyone who can pick up a piece of old iron and an old packing case, can make the whole thing for what it costs to buy the tin chimney and burner. Having said the brooder will be better than you can buy, and better than a hen, I will explain. The heat comes up through the round hole in the middle, under which the lamp is placed, it is held by the hover, and you turn your lamp up gradually until heat is 90 deg. against the tin ring under the hover, now place the thermometer outside the hover on the floor and you will see it fall to 80 deg., place it over in a corner and it goes lower still; you watch the height of the frame in the lamp when it is giving 90 deg., and after that turn the flame up to the same height and you need never dance round the thing as you would have to do on one without that centre tin and hover: if such a brooder got too hot anywhere it would be too hot everywhere: but in mine, if the heat goes to 100 deg. or more under the hover, chicks finding it too hot will come out, in short there is a safety valve of at least 15 degrees: leave the top door loose always so as to allow a free current of hot air to be passing continually up and out, do not let the door fit tight. The brooder can be worked at far less cost than any other, because it burns less oil, it is far safer because the lamp need not be turned so high.

* * * *

Directions for Working Brooder.

It will pay you to have a brooder even if you have no incubator; you can take chicks from hens, put them into brooder, set hens again, or set them laying, and their eggs will far more than pay for oil used in brooder, and is less trouble to look after than hens, chicks do not get lost in long wet grass, do not get drowned in thunderstorms, do not get killed by cats or crows. A day before you want to use it light the lamp, which must be on the ground: when you see the thermometer at 90 degrees under hover it is ready for chicks; place thermometer on hover under glass where it is easily seen, it will be 80 deg there. Get a treacle or honey tin, make a hole with a nail near the top, fill with water, place a saucer on top, turn over sharply; water will come out of nail hole which, of course, must be below top of saucer, and you have the best fountain in existence, because it is all open and you can clean it out, costs nothing, and chickens cannot get into it to get wet; mind if you put a water vessel which chicks can get into, they will do so, get wet and die; a chicken chilled is a chicken killed—no use drying and warming, it will never grow up. Your brooder must never be without water. Cover the floor with coarse sand half an inch deep: procure a tin top to a tea tin to put feed in, then a boiled egg and a handful of coarse oatmeal, mix up well and put on the lid of tin, and it is the first meal, feed little and often, same thing, gradually increasing oatmeal. In a few days open small door, let chicks out on to the grass in a wire netted run, or into a shed; keeping the brooder in a shed is far the best way, giving a sod of grass, lettuce and cabbage leaves. A few bricks to help them up to the door; after a week the lamp can be put out in the morning, lit about 4 o'clock, and very dry pollard and cracked wheat provided instead of eggs and oatmeal. I mix pollard and wheat into a hard dry ball, and they pick at it all day; how long they are to be kept in the brooder depends on the weather: don't let them perish

Last, but not least, use the best oil, keep lamp clear, don't turn too high and it won't smoke. Only one point must be rammed home hard, take care the iron floor fits tight, and the battens are tight so that smoke cannot get from lamp or under compartment into the upper part where chicks are, that is the only important point in the whole affair.

You must heat other brooders up to 90 deg all over. Mine only requires to be heated up to 75 deg (it will be 90 deg under hover), it is far safer, because danger only comes in when the lamp is turned too high, smokes, forms lamp black, which takes fire. As it is not necessary to turn the lamp nearly so high, it will not smoke; but if the operator wants te heat up quickly and does not turn it too high, and it takes fire, there is no danger if you make the brooder 3 ft square, as the lamp is on the bare ground (must be), and can only blaze against a sheet of iron; leave the filling oil hole always open and the lamp cannot explode—it is dead safe and will beat any hen.

It is obvious that men who live near a city will not make a brooder—they can buy one. My object in giving these directions is to enable the men who live miles from a town (and could not buy a brooder on account of freight charges if nothing else) to make one; any old boards will make the thing, and a sheet of iron from some burnt down house will do for the iron, parcel post will bring the burner and chimney, and if you have not got a soldering iron use a red hot bit of fencing wire—a bit of resin, and anyone can solder it on.

It requires comparatively little attention, because it has virtually three different degrees of heat, if the lamp is left too high and it gets too hot udder hover, chicks will go out—if still too hot, they will go into a corner: if the lamp is too low they will push up against the tin rim under hover, and that will always be hot enough unless you are going to neglect the thing completely. None of this can be applied to the ordinary brooder, for if that is too hot or too cold anywhere it is so everywhere.—Australian Agriculturist.

The business of Messrs Blanden Bros is now being carried on in their new premises, opposite St. Peters Town Hall, Payneham Road, where samples of all classes of work are on view for inspection. The several branches of the trade, comprising paperhanging, sign writing, &c., are contracted for and carried out in a thorough tradesmanlike manner. No better recommendation can testify to the superior way in which this firm executes their work than the numerous prizes and medals they have won at local and interstate exhibitions Customers can rely on all work entrusted to this firm being well and faithfully done at a reasonable cost

The well known firm of W. Coats and Son are now showing first class pink eye seed potatoes. They report a good business in oranges, and an increasing demand for Terry's jams.

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The Australian Gardener

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Flower Garden.

Operations for November.

By J. Cronin.

Cultivation.

The most important work during this month is reducing the surface soil to a condition of fine tilth, and applies particularly to soils of a heavy retentive nature, where the surface is rough and the soil in large lumps. The occasional showery and drying periods had a decidedly beneficial effect on such soils, and these, if well worked and pulverized during the present month, will retain the moisture already in the soil mass. In addition, cultivation will make available for plant food elements that the decomposing effects of the atmosphere had produced, beside keeping weeds that would impoverish under. The draw-hoe is by far the best implement to use in heavy soils, a blade 3 or 4 inches in width being most suitable, while in light and sandy soils the thrust, or Dutch hoe is preferable. Care should be taken not to approach too closely to the roots of plants, particularly those shallow and fibrous.

Chrysanthemums.

There is no plant more generall grown for exhibition, especially by amateur gardeners, than the chrysanthemum, a fact that is probably due to the hardiness of the plant, and also owing to the possibility of getting the best results in six or seven months. Where it is intended to grow them in the open ground, the plants should be put out in beds that have been specially prepared. Chrysanthemums are greedy plants, that will almost grow on a heap of manure, but superabundant growth is not by any means desirable or necessary. A fair, sturdy, well-ripened growth, will, if properly managed during summer, produce large blooms of good quality. A well drained and fairly manured bed is needed, the manure or manures being added according to the poverty and needs of the soil. Provision must be made for the protection of the blooms from rain, dews, and sun, during the flowering period, and to facilitate this the beds should be made narrow, about 6 feet in width being suitable. Two rows of plants will be accommodation in such beds, leaving a space of about 2 feet between the rows, and 18 inches between each plant. Rooted cuttings or sucker growths of moderate size are most likely to grow into sturdy plants that will produce good blooms.

Dahlias.

Beds intended for the reception of dahlias should again be dug deeply, and the soil and manure well mixed. If it is found that the soil is too heavy and close, some sand, ashes, manure, or anything that will have a tendency to make it more porous and open should be adeed. If on the other hand, it is too sandy, clay, loam, or cow manure will improve it greatly. A fairly friable loam is the desideratum. Except in cool and late districts, it is not advisable to plant dahlias until December; but if an early blooming is desired, some may be planted now. In dividing roots, care should be taken to do so from the crown downwards, leaving one or more eyes or buds on each division. Cactus dahlias are much more popular and desirable than the older show types. The blooms are much lighter, more graceful, and the colours more varied.

Delphiniums

are gaining in favour rapidly, and many improved varieties have been imported. Some of these later varieties are very fine, and are undoubtedly among the best herbaceous plants cultivated. They are scarce and expensive at present; but seed and seedlings are cheap and plentiful. A type known as Kelway's hybrids is a strong-growing free-flowering strain, seedlings of which will bloom in a few weeks. They require rich soil, and generous watering, when making flower spikea.

Summer bedding plants such as Iresine. or blood-leaf, Alternanthera, Lobelia, &c may be planted, as also Salvia "Bonfire." Seeds of annual and perennial plants may still be sown.

Violets.

Violets are best shifted now. Delay no longer, for it is infinitely better to lose a little of the flowering, and to get the shift made before the very hot weather comes in, than it is to wait for the last bloom, and lose the young plants after shifting them. Dig the old borders out, and take the young plants—those without hard-looking old crowns are the young ones—and put them into good borders of friable loam, at about eight inches distant from one another. Put in a double row if you like. It is much better to do two rows than one. In this way you have a double chance. Let the plants be arranged so as not to bring them quite opposite one another. Plant Princess of Wales wherever you can; it is the violet we like best of all.

Petunias

Should on no account be forgotten Buy the best seed you can, and be careful with it. Put it out in a seed pan or box filled to within half-an-inch of the top with loose sandy soil, and be careful how you use the watering can. Prick the young seedlings off into another box or bed as quickly as possible, and get them into their permanentplaces when they are an inch or two high. There is no time of the year when the petunia will not flower if it is placed in an open, sunny position.

All through the winter we have been watching a lovely show of these popular flowers. When there was nothing else to see those petunias made the garden bright. The newer single varieties are much the showiest, and according to our way of thinking are much the prettiest. Ask for any of the grandiflora sorts. They cost 1s per packet, but not a seed should go to waste. Young plants are easily grown at this season from cuttings. Take the ends and insert them in pots of light soil, with a layer of clean sharp sand on the surface.

Marigolds

One of the best late summer and early autumn flowers is the new African Marigold. It is quite a gem, free in flowering, glorious in orange and yellow coloring, and as good in growth that anything we have grown for a long time. Ask your seedsman to send you a packet of each of the two colours, and get them out into seed beds as quickly as possible. They are not afraid of heat, and will thrive where most things die. Try and not over-manure the seed beds, as it is better that the young plants should make sturdy growth, rather than grow spindly.

Amateurs frequently make a very great mistake in preferring tall seedlings to those which are short and stunted. The short ones usually make the best flowering plants. With stocks and other things, about which there is no certainty of the flower coming either double or single, the stocky, stumpy plants are almost invariably double. This is a point worth remembering. Get the seed of the marigolds sown, so as to be in time for planting it out early in December. For a bed, or as clumps, in the herbaceous borders, these Africans are really fine. Last year we flowered them in between our dahlias, and they made quite a pretty effect with their yellow flower balls in among the rich green leaves of the tall growing cactus dahlias. These friends bloom well on into the winter. Even the old French Marigolds are worth a place in our affections and our gardens.

Zinnias

Early spring is the Zinnia planting time. This glorious race of flowers does a royal work at a time when so many of our friends are either off through the heat or out of season. Zinnias are not difficult to raise, nor are they hard to get at their best. A light soil with plenty of manure, or clayey soil enriched rather more than usual and a plentiful watering will force your Zinnias to do their best. For the past two seasons these flowers have done very well with us. Some of glandiflora varieties are extraordinarily large in, their blooms, many of them being equal to a fair-sized dahlia. The show they make when set in a nice large bowl, with their brilliant heads and firm-set leaves, all striving to please, makes them hard to equal. For garden decoration there are quite a wide range of color and form among the zinnias, some of them being quite as tall as an ordinary-sized man, and others so dwarf that you need a good eye to find them out.

Put the seeds out now that the weather is warming, and keep them moist by an occasionaal watering with a fine rose can. A light layer of fresh manure will help to keep the surface of your seed beds moist. Let the zinnia be among the first of your seed plantings.

Cannas, Carnations, Columbines, Centaureas, Canterbury Bells, Cornflowers, Chrysanthemums Dahlias, Gaillardias, Hollyhocks, Pentstemons, Sunflower, French Marigolds, ordinary Marigolds, Verbenas, Marguerite Daisies of all sorts, Sweet William, Dianthus, are all in season for planting out in beds or borders.

Keep the hose playing on your grass plots and lawns. Sprinkling the grass while the sun is shining keeps it green.

Any of the ordinary Marguerite daisies strike very easily from cuttings. Take pieces about 6 inches long, and pot them off in a lose soil, and keep moist. They stand a dry climate, and keep the garden bright when other flowers fail.

After your Stocks have flowered themselves out, cut them down below the flower stems and give them a chance of coming into bloom hgain early in the autumn. Many of them will do this.

Delphiniums are coming into growth now. If you can procure your plants get them out at once, without further delay.

Dahlia Growing.

A night or two since we met Mr G. H. Kerslake and very naturally got into a talk about dahlias and how to grow them. Mr Kerslake has the distinction of being one of the best dahlia men in the Commonwealth. In the course of conversation he told us several things of interest to the men and women who number themselves among the lovers of this exquisite flower.

His most important statement was: Impress upon your readers the advisableness of waiting until late November or early December before they put their plants out. Early planting of the cactus dahlia is not a good plan. The autumn is really the best time for perfection in these flowers. December planting leaves you a chance of getting the best work from the plants at a time when the season is suited for both form and colour. Where is the sense of forcing frail dahlia blooms in the middle of December or January. They are not half as beautiful as those which come about March. We have both, and are quite of Mr Kerslake's opinion. Show growers all follow the same plan.

If you must have early dahlias plant out the common sorts. Let these battle through the hot season and reserve the best time for the best varieties.

Queenslanders should plant about the same time as do the New South Welshmen; but Victorians and South Australians might put their tubers out a month earlier.

Plant the tubers out in a fairly rich soil, near enough to the water tap to make frequent watering easy. Dahlias need a lot of attention in this way. Give the holes a good bone-dusting and always keep the surface of the soil well mulched with either garden refuse or manure. There is nothing a dahlia likes so much as a nice, cool soil. Too much heat only burns the stems and reduces the flowering.

Propagating by means of the young growths is the method now most in vogue among show growers. The shoots are allowed to grow about four inches long, after which they are taken off and potted up in a very open sandy soil, until they have rooted. A shady bushhouse or a cool frame is the best place for this work. Too much water injures the cuttings and too little dries them off. Keep the pots buried in sand and protect them from wind and sun. Some of our friends, particularly Mr R. Henderson, who might be called the father of the colonial dahlia growers, shades all his cuttings with glass bottles, the bottoms of which have been taken off. He has an ideal shade under a wide-spreading guava tree, and has the luck of a magician in raising plants from cuttings. Let the cuttings be about the thickness of a led pencil. Too much manure will make the dahlia growths rank. Rather a moderate supply is best, as the plants and flowers are more hardy under a moderate feeding than they are when forced by heavy manure supplies.—Amateur Gardener.

Improving Phlox.

C. S. Harrison in Florists' Exchange:

Along in the fifties, I used to ride over the virgin prairies of Minnesota. They were immense flower gardens. Often I would go through beds of wild phlox of thousands of acres. It was a wonderful scene. Those cheerful flowers greeting you on every hand, and billows of fragence floating in the air.

Our wild phloxes were sent to Europe; miracles have been wrought from them, and we are at the beginning of a new era in their cultivation. We have depended on foreigners for the improvement of the phlox when we can do this ourselves.

Note the evolution: The wild flowers were the size of a dime; under careful training they grew to the size of a quarter, then as large as a half dollar. Then came the announcement that Crepuscule was larger than a dollar. I secured a quantity. Now, for the West we need a strong vigorous plant, with a full symmetrical head and flowers that will sunburn when the mercury soars to 100 and over, as it often does. Our favorite met all the demands. In the West we want size and must have hardiness. This plant is of a dwarf habit. That is all right. It prefers to put its vigor into flowers rather than into wood. The plant continues a long time in blooming.

Around the group of Crepuscule I planted some fine imported ones and some choice seedlings. In the Fall the seeds were planted. They came up early, in July were in full bloom, so that in less than a year I knew just what I was doing.

I have seen quiet, gentle women, who would impress themselves on the whole community, and the whole neighborhood would be changed by their presence. It was so with our favorite

I let the bees do the crossing, and as the result I found at least twenty kinds of marvellous beauty, most of them with very large flowers, some larger than a silver dollar.

Coquelicot, for instance, is from France. It may be alright there, but in the West it is feeble and the glowing scarlet flowers sunburn badly. But, the seeds of these, grown near this genial neighbor, brought plants much more hardy, with flowers twice their former size, which endured the heat much better.

In color Crepuscule is white, with a violet shade, and an extra large purple carmine eye. I noticed with much interest the impress made on the white, for I found some much larger, with most delicate tints of tracery, which made charming flowers.

In animal breeding, what is called prepotency is an important factor, the parent making a patent impress on the offspring. This trait is seen in plant life. The Wealthy and Duchess applies, the Concord grape, and many other fruits exhibit this trait in a remarkable degree.

I raised about 10,000 fine seedling phloxes this year, and among them are many much finer than we import. I notice one thing in a marked degree; those fertilized by that royal parent are very much larger than the others.

Now I have sent for the very largest and finest the earth affords, regardless of price. I have a dozen kinds growing. I shall take the choicest seedlings and plant near these, and from the seed I know we will have perfect surprises of loveliness.

Now, when I went into Nature's inner temple to study her miracles and aid her in these marvellous transformations, I left the door wide open, and all of you come in and let us see what wonders we can produce with these charming flowers in a few years! They stand next to the peony in hardness and showy bloom. Among peonies we must wait from five to eight years to know what we are doing. With phloxes we find out inside of a year. In selecting, we want a full head, symmetrical in form, a good strong stem, continuous bloom, fine color and large flowers. Remember, that with proper attention you can have these flowers in great masses from June till November.

The Orchard.

By James Lang, Harcourt.

Cultivating.

Ploughing and cultivating the orchard should be pushed on as rapidly as circumstances will permit, and finished as early as possible in the month. After the ground has once been turned over, it is an easy matter then to keep it in good tilth throughout the summer. When the surface of an orchard is well cultivated, it is astonishing how it conserves the moisture in the soil, and is one of the chief means of making an orchard a success. This is more particularly applicable to orchards in dry districts, where water is not available for irrigation.

Spraying

for the black spot on the apple and pear should receive errly attention. Experience has proved that the best time to spray the trees is just before the blooms burst, the spores of the fungus just starting into growth are more easily destroyed by the spray. The 6—4—50 formula (6lbs. bluestone, 4lbs. lime, and 50 gallons water) for making Bordeaux is the best strength to apply.

Codlin Moth.

Spraying for the codlin moth will also have to be attended to during the month. The first application should be given just as the petals are dropping from the flowers; the calyx being then open receives some of the poison before it closes up. One of the best sprays for destroying the codlin moth is arsenite of lime. This was used by the writer during last summer with great success, and without injury to foliage It is prepared in the following manner: 1lb fresh lumpy lime should be slaked in a bucket, and then 1 gallon water added, and stirred well. This should be strained through a bran bag or other similar material, when you will have milk of lime. Put this in a kerosene bucket to boil, adding 1lb. arsenic; let it boil slowly for three-quarters of an hour. As some of the water will have boiled away, add sufficient water to make up to 1 gallon. If put in airtight vessel, it will keep good for a very long time. This forms arsenite of lime. Use 1 pint of the liquid to 40 gallons water; no further addition of lime is required. It is the cheapest and one of the best sprays that can be used, and will not injure the foliage. Bandages to trap the codlin moth should also be put around the trees this month.

Grafting

apples may still be done if the scions have been kept in a backward state. When the scions start into growth keep the stock free from growths.

Fertilization.

It is a curious fact that though single petunias are grown in unlimited quantities, seed of the best strains are usually scarce, and I have proved that when it is saved in the ordinary way—that is, from those which seed without artificial aid —that is, from those without derioration in the progeny; with care, however, the best strain will seed well, but it must be done by artificial fertilization, or rather, by human aid. There is no difficulty in transferring the pollen from the anthers to the pistil by the aid of a soft camel's hair brush (or pencil, as it is usually termed; yet a little judgment should be exercised), indiscriminate crossing of different colors will be fatal. Starting with whites, if it is desired to keep to pure whites, the best formed flowers should be impregnated from another of equal quality, or at least of the most pure shade, and working; up if each separate shade can be had in flowers of good quality on plants of good habits. Intercrossing should be avoided as far as possible; yet may be advantageous to take pollen from a good bright color and apply it to a white of good form I have found in crossing it requires some discrimination, and it is only observation and actual practice that will secure the best results; and it is a curious fact that all the "rogues," or those of inferior quality, seed freely, without aid; this accounts for so many of inferior quality seeding freely, without aid; this accounts, also, for so many of inferior quality from seedthat has not been carefully selected. The work of fertilized will give more seed than a large batch left to fertilize by natural agencies.

In gloxinias we have similar results. I have had more seed from a dozen plants which I have fertilized by the aid of the brush than from hundreds of plants which have been left to natural agencies. In almost all gloxinias the pollen will be found to be abundant, yet somehow or other it seems to fall short of the pistil, or it may be that the pollen taken from another flower is more efficacious. At any rate gloxinia seed saved from a choice strain makes a fair price. I am not quite sure what the ordinary price would be in the trade, but going back to the petunias I have known seed sell at £12 per ounce, but for a fairly good strain from 50 shillings to £5 is about the usual price. This reminds me that petunia seed may be kept for a long period. I have had seed four years old which has germinated as freely as that saved the previous Autumn, but it had been kept in a close tin box in a cool place; yet gloxinia seed kept under the same conditions failed after the first year. It is possible, however, that the gloxinia seed kept under the same conditions failed after he first year. If the gloxinia had been ept in a warmer position it would have survived and retained its vitality for a longer period. I may mention corms which have been kept in a cold place, even if not touched by by frost, and appear quite sound when put into warmth to start them, will fail to start, though the corms may appear quite plump and sound, while those which have been stored in a warm dry place and shrivelled will start when given a little moisture and other genial conditions.—Metropolitian, in Horticultural Advertiser, England.

Florists, both amateur and professional, were very much interested in the cactus dahlias exhibited last season by Mr H. Kemp, of Unley. He now announces that he has flower seedlings for spring and summer planting at 2s 6d per 100, post free.

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The Ideal Country Home for the Man of Modest Income.

BY OGLESBY PAUL, PHILADELPHIA.

NO doubt many of you will laugh at the title of this article, 'The Ideal Home,' and yet seriously, how many people have ever thought this subject out and reached a definite idea? Most people, I have found, are like sheep in their home-making, following where others lead, and judging from the evidence at hand, the leaders usually were blinders. Take the average suburban settlement, for example, where the properties are an acre or less in extent, and it is of small places only that I shall refer to. The houses in such places are usually comfortable and attractive now, thanks to the skill of our architects, and the real estate man may usually be trusted to see that they have all modern improvements of water supply, drainage, lighting, good roads, and the like, of the necessities, as we call them, of modern life The land, too, has been improved—the roads are shaded by trees, and the gardens are neat lawns with here and there a tree or clump of bushes. So far so good, but after all, does this represent the ultimate perfection of home-making? The houses are vastly more homelike and interesting than those of thirty years ago, almost as homelike as those of our grandfathers' day, some malicious critics would say; but the gardens are wofully bare and dull. Think of what one can do with half an acre. Yes, and what paradises they so often were in our grandfathers day. Then wonder at the bare half acre you see now. Surely the house and grounds together form the home, and the grounds even more than the house should reflect the personality of the owner. Study, and the mental picturing of your grounds as you would have them appear, alone make this possible, and then, remember that planting and once again planting, is the secret of success. How many handsome houses do you see in a day on lots bare of individuality and interest, dotted with a few trees and scattered

Gloxinias.

bushes, which might be made beautiful by intelligent planting? The passerby on the highway can run his eye over the entire estate and include in a glance everything save possibly the door at the rear. What privacy is there left in such a home?

Having thought much on the subject, I herewith give you the picture in my mind of what such a half acre might be.

The plot, we will assume, is rectangular, without features of any sort and nearly level. The house faces west, toward the street, and stands some fifty feet away from it. To decide the separation from the street we will carry a hedge of privet across the front and lead a path directly from the front door to the street. By screen plantings of bushes from the corners of the house we will cut off the rest of the place from the public eye, which must be content with a view of our front yard, and no more—this much we concede to the general good. (And here I know there are some who will say I am conceding too much, and should shut the public out altogether with a high wall. However, walls whether good or bad, cost money that we need for more important things,)

Either side of my walk I would have a little lawn, and behind it, next the margins, irregular enclosing borders of shrubs. Stout, coarse growers are not wanted, or they will soon outgrow our space: but there is a wealth of material at hand for our purposes. In the corners, where height is needed, might be forsythias, the golden glories of the Spring; preferably only Forsythia Fortunei and Forsythia suspensea, as viridissima is too coarse and Sieboldi differs but little from Fortunei. Of the viburnums we can find room for plicatum (the Japanese snowball), and opulus, the singla type, the old bush cranberry of our grandfathers. The weigelias, especially the newer varieties, such as Eva Rathke, may find a place, as also the bush loniceras, tatarica and bella candida, charming for their bright fruits in July, and fragrantissima for its perfumed flowers in early Spring. As lower growers with these would be the lavish tribe of Rosaceæ, Spiracæ, Thunbergii or arguta, the bridal wreaths, most lovely of Spring flowering bushes, with the more vigorous Spiræ Van Houtei for later bloom; and perhaps, in a pocket in front of the border, the dwarf Spiræ Anthony Waterer rnd Spiræ salicifolia. Rosa rugosa alba and Mme. Bruant deserve a place, and if we can get it, the new rugosa alba repens. The list of roses should include our native Rosa lucida, Mr Dawson's new lueida alba, Rosa nitida, that hedge of thorns, Rosa carolina, the tall swamp rose, and Rosa setigera, the wild July blooming rose of the prairies. Ribes sanguinea and aureum, the red and yellow currants, Rubus delicosus and Exochorda grandiflora, the pearl bush, are worthy of places.

The old-fashioned Spiraea prunifolia, with its wealth of double white flowers, invaluable for cutting, will delight you if tucked in behind some such spreading flowers, invaluable for cutting, will delight you if tucked in behind some such spreading grower as the dwarf Ligustrum regelianum privet to soften the effect of its stiff habit of growth. The althea, its companion in old dooryards, should be included, especially the red and white varieties, as they occupy little space, and bloom in Midsummer when few shrubs are in flower.

Of dwarf-spreading bushes for the foregrounds of these borders we have Berberis Thunbergii, Ligustrums regelianum and medium, the latter a seldom planted but valuable form of ovalifolium, of dwarf growth, and an abundant bloomer; Hydrangeas paniculata grandiflora and quercifolia (interesting in its semi-prostrate habit, handsome leaves and graceful heads of flowers). A corner, too, may be found for the climbing hydrangea, Schizophragma hydrangeoides, and where it can be trained over the side of the building there are few plants more handsome.

Then where we wish to bring the shrubby down to the grass line without that hash margin common along shrub beds, we have many charming plants of low stature. Deutzias gracilis and Lemoinel, Hypericume aureum, prolificum and Moserianum, Xanthorhiza pilfolia, Euonymus obovatus, and more. Still further to break up the stiffness of the bush forms, a plot of bittersweet, Celastrus scandens, or the Japanese Celastrus articulata, and Lonicera Halleana, is invaluable, rambling over the ground, mounting on the nearest bush, every breeze sweeping its graceful outstretched tendrils to and fro in the air. In the grass, near the walk, there is a space for a small flowering tree or two, such as the double scarlet thorn (Crataegus oxyacantha rubra fl. pl.), the single English thorn (C. oxyacantha) the white thorn of Milton, the golden shower laburnum, the pink dogwood, C. florida rubra, or the like.

For detail in the shrubberies there is an array of interesting seldom-grown bushes, for some of which we can find space. Styrax japonica, Symploccos crataegoides (a hardy bush, bearing bottlerush white flowers), Caryopteris mastacantha (the blue spirae of the trade list) Pyrus japonica, for its cheerful red blossoms so early in the season, Prunus amygdallis, the flowering almond, Rhodotypus Kerrioides, for its neat habit, clear white flowers and black fruits, and Kerria japonica, preferably the old single form, as its growth is better and flower more graceful.

Now let me pass from the front dooryard through the screen planting, into the wild garden, which lies on the south side of the house, shut out from the public gaze by these screening bushes. It will be simply treated, consisting of masses of wild flowers and rock-loving plants, through which we pass by a trail that divides into two winding walks. The grading would be that of a little vale, the ground rising at the sides, forming slopes which are to be clothed with the rambling, sprawling bushes and plants found in the wild spots, such as the brambles, Rubus odoratus, incisus and dumentorum, struggling down between the taller lycium, symphoricarpus and some sambucus. The backgrown would be of such things as Rosa multiflora and canina, Cephalanthus occidentalis (the cotton bush of our northern swamps, which vies with the sembucus and clethra to make glorious the bogs in Midsummer), the seathery tamarix, Eleagnus multiflora, Berberis acquifolium, Andromeda speciosa, Fendlera rupicola, Robinia hispida, Rosa spinossissima, and many others; and on the irregular sloping foreground tufted masses of heather, Calluna vulgaris, Iberis sempervirens aud tenoreana, Daphne cheorum, junipers of various kinds, from the creeping postrata and sabina to the upright japonica, sinensis, and virginica, yuccas, Azalea amoena, Spiraeas ulmaria, primata, tomentosa and aruncus, carpeting the ground in the inter spaces with Euonymus radican, Lathyrus latirfolius, the everlasting pea, broken by tufts of Armeria maritima, Orobus vernus, Arabis alphina Alyssum saxatille, Aquilegia canadensis, Œnotheras Youngii, biennis, the white flowered speciosa and the aster-like O missouriensis, the latter, by the way, a great favourite of mine, opening its golden salvers as it does daily for months at a time. Here, too, there is space for many. Spring-blooming bulbs and such wild flowers as the sanguinarias, anemones, violas, tiarella, the Phloxes subulata, carolina and stellata.

(To be continued.)

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Near Wallmann's. Adelaide.

Messrs W. H. Coats and Son report that the fruit crop this year is at least three weeks to a month late. Apples, for instance, were an inch in diameter on November 1st, 1904, and were severely damaged by a hailstorm; this year the trees are only just showing for buds. This is due to the intense cold and wet weather, If the weather is favorable, the early varieties will be late: but the later varieties will ripen in their usual season. The strawberries promise well, and buyers should get them direct from the grower. This firm's orchard at Ironbank, where there are 2000 fruit trees in bearing, would well repay a visit.

Mr A. Nelson having removed his cycle and motor works from Pirie-street to 105 Parade Norwood, opposite Baptist Church, wishes to intimate to the public that he has up to date facilities for the manufacture and repairing of all makes of cycles on the shortest possible notice. The attention of market gardeners east of Adelaide is called to this notice, as they can leave their machines at any hour (Mr Nelson lives on the premises), and they can call for them when returning home from market. As Mr Nelson has gained a large and varied experience during the last sixteen years that he has been in the cycle trade, we feel justified in saying that his work is reliable and his charges reasonable.

The most precious plant food in manure is its nitrogen compounds, because they are exported or carried off the farm in the product sold in larger quantities than either potash or phosphates, and because they are also most easily lost from the manure of the soil through careless management of the manure or the feeding of the crops. It costs more to replace than any other plant food.

Agriculture and Stock.

Rotation of Crops.

R. W. PEACOCK.

THE most economic system of farming is one based upon a system of rotation of those crops found most suitable to the conditions of a district. It is fortunate that there is such a wide range of crops from which to choose, also that there are various avenues through which such crops may be turned to profit. A profitable system of rotation is inseparably connected with mixed farming.

Mixed farming may be interpreted to mean a system in which crops may be grown for direct sale, and also for indirect sale, in the forms of live stock and their products. Such a system allows of the soil, the rainfall, and the atmosphere being linked together most effectively and economically.

Amongst the advantages to be gained from a rational plan of crop rotation are the following:—

Soil fertility is retained and, under certain conditions, increased.

The plant food of the soil is more economically appropriated.

There is not the same necessity for applications of manures.

Cultivation necessary for the successful culture of one crop may materially benefit a different crop to follow.

Weeds which thrive amongst certain crops are checked, and often exterminated, by resorting from one crop to anothar of a different order.

Plant diseases and insect pests may be checked, and often prevented, by a systematic change of crops.

The locality of live stock is continuously changed, allowing the pastures to sweeten and the destruction of parasitic germs.

The farm work is more evenly distributed throughout the year, which brings about continuous employment and a more settled class of agricultural laborers.

Risk of failure is minimised by not staking all in one venture.

It allows of monetary returns being available at various seasons of the year.

The elements of plant food of most importance to the farmer, owing to their being readily exhausted, are nitrogen, phosphorous and potash. Plants differ in the relative quantities of these elements they require. Cereal crops, if grown for many years upon the same field, may suffer from exhaustion of one or more of these elements, and are benefited mostly by applications of phosphatic and nitrogenous manures. Leguminous or pod bearing plants contain quantities of nitrogen, a supply of which they are enabled, by the aid of micro-organisms, to obtain from the atmosphere permeating the soil. Cereal and other crops have not this power.

Applications of nitrogenous manures, are therefore, not so necessary for leguminous crops. Potassic and phosphatic manures generally give beneficial results. Root crops contain considerable quantities of potash, and are benefited by manures containing the three ingredients. The soil may have an abundance of one and be deficient of others. Fertile soils contain an abundance of available plant food. Some crops are surface feeders; others obtain part of their nourishment from a considerable depth. Cereal crops are comparatively surface feeders. Wheats and ryes root deeper than barleys. Lucerne is a very deep rooter, and collects plant food from considerable depths, and it comes to the surface in the form of crop. Clovers also root fairly deeply, and when these deep-rooting plants are fed to stock on the field, a considerable quantity of the plant food from below enriches the surface. Root crops, such as carrots, are deep rooters, whilst potatoes are surface feeders. Root development has a considerable influence upon the mechanical conditions of the soil.

Wild Nature Scene at St Katherine's.

Sarghum
Amber Cane Lucerne
Essex Rape
Globe and Long Red Mangold
And Paspalum Seed
o o o o
Bone Dust
Bone Super Ammonia
Etc. Etc.

Shell grit | Oyster shells
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Dairy Industry.

1. When farm crops are fed to live stock and converted into marketable or manufactured articles, such as milk, butter or cheese, they will return a much greater revenue than could be secured from the sale of those same crops in the crude form.

The sale of the entire crop each year removes he plant food from the soil slowly, but surely, and produces undesirable physical conditions in the soil, which cannot be altogether overcome through the use of artificial fertilisers alone.

2. The dairy business, therefore, aids greatly in restoring and maintaining the fertility of the farm. Two questions are asked most frequently, the one, "How does the keeping of dairy cows tend to increase the productiveness of the farm more than other kinds of live stock?" and the other, "Why do you advise me to keep cows? I don't like to milk?"

In feeding beef cattle, sheep or swine, about the same percentage of the food consumed is voided in the form of liquid and solid excrement as in the case of dairy cattle, but when the meat producing animals are marketed large quantities of plant food leave the farm. Fat steer or heifer goes to the market at from 24 to 30 months of age, while the good dairy cow remains to the age of ten or twelve years or even more.

In the bone, muscle, tendon, hide, etc., of the steer large amounts of nitrogen, phosphoric acid and potash are carried away, while the fat of butter consists largely of carbon, hydrogen and oxygen, of which there is such an abundan supply that the plant is seldom if ever in need o them.

The form in which dairy products are disposed of will materially influence the amount of fertilising material left on the farm. Considering the question from this standpoint, that method of procedure by which the skim milk is retained for feeding purposes is best: it can then be used in rearing both calves and pigs, during which process a large part will return to fertilise the soil. The least fertilising material is removed from the dairy farm when butter is manufactured, more material is removed by the cheesemaking, and whey, a less valuable product than skim milk, is left for feeding. As the farmer is deprived of both skim milk and whey when the milk is sold outright that method of disposal which leaves the skim milk on the farm for feeding purposes cannot be too highly recommended.

3. Dairy farming is a particularly desirable occupation for the man with limited means. He can begin and conduct the business with much less capital than those engaged in meat production. Of course it means constant hard labor, but this can be made to supplant a large part of the capital that would be otherwise needed and which the poor man has difficulty in obtaining In the dairy business cash returns come seldom less than once a month and frequently oftener, whereas in pork, mutton, or beef production the returns come but two or three times a year.—Michigan Farmer.

The Draught Horse.

The up-to date draught horse is one that stands close to the ground with short legs and broad base. The feet are well apart, with space enough for another foot of the same size to be placed between them. The back of this animal will be somewhat shorter than that of the speed horse. It is with the hind legs that he propels himself, and thus it can be seen that, since the collar is on the shoulder, the whole weight of the load is drawn by the back. Therefore, it must be short and well muscled.

The shoulder of this horse is long and well shaped, so as to give a good base to the collar: it should be more nearly perpendicular than that of the speed animal. However, sloping shoulders are often found in our best draught horses.

The hocks of this horse will show rather a narrow angle, because it is by this that a greater leverage is given, and he is able to move heavy loads.

The body is massive, low set, ample, very muscular and cylindrical. The horse should have solid, large broad bones and limbs; the latter are well formed and properly placed under his body.

He should have large, healthy, well formed hoofs, heels well separated, frog strong, healthy and quite hard: good physiognomy, plenty of style and action, ardour and endurance. He must have a short, rather straight pastern in order to do the heavy work required of him.

His weight should be in the neighborhood of a ton; if he weighs a little more or less, but is good otherwise, he will not be long without a purchaser.

The animal can be of any draught breed. Each has special characteristics, which commend them to their admirers. It is not necessary at this time to favor one and condemn the others, for all breeds sell alike when the animals are of the right kind. We say that it is quite easy to describe the animal we would like to produce, but to produce him is another thing.

A short time ago any horse that would weigh 1400 or 1500 pounds was awkward, big headed, lazy, and good for no particular labor, was classed as a draught horse by the layman. Today in many places this same notion prevails. If we will become acquainted with the animal many farmers raise and force upon the market, we will find they are not draught horses, neither are they road or coach horses, but quite likely a lot of misfits that belong to no particular class, and for which there is no market. The farmer should learn to produce that which the people want and the market demands.

Breed for merit as well as pedigree, and if breeding for speed see that the ancestors of both sire and dam are bred in the most successful speed producing lines. The greater the number of famous producing sires among the near ancestors the better.

Mr. F. G. Lillingston, electrical engineer and contractor, also importer and electroplater, of 122 Grenfell-street, city, reports that he is doing excellent business this season. He has received an order to furnish a new residence with electric fittings throughout. Although the house is a large one, the owner has decided upon having no chimneys in it, depending for light, heat for cooking and warmth, &c., upon electric furnishing. Besides the great saving effected in the non-erection of chimneys, the saving in space is also a great recommendation for utilising electricity in this direction.

The proprietor of the Southern Cross hotel is a lover of flowers, and makes his well known establishment attractive by a lavish display of floral decorations. The hotel is one of the best conducted in the city, and is a favorite place of residence for country and interstate visitors during their stay in Adelaide.

The Most Profitable Horse.

The question is so often asked—"What is the best and most profitable breed of horse to take up?" that a general reply may be given here. There is no most profitable horse in the accepted sense of the word best, as almost every element of success, apart from a spirit of perseverance on the part of the breeder, depends upon the conditions under which he lives.

The question of soil, of climate, of space, and to a lesser extent perhaps of personal inclination, must all be taken into consideration, before a stud can be expected to pay, for horses, though they may exist, and even thrive under congenial conditions, require to be most carefully studied in the matters referred to above if it is desired to produce them and bring them to maturity at their very best.

The business of a horse breeder is always more or less of a speculative character, so far as the production of animals of the very highest character is concerned, but, on the other hand, a persistent attachment to the orthodox rules of breeding is morally certain to bring its reward in the long run By this it is meant that if the owner places the proper kind of horses upon his land, exercises proper judgment in thinking out his crosses, and sticks to blood without being led away by outside influences, such as a win at a show, if he does his animals properly and perseveres, he is very likely indeed to make his stud pay him well.

Misfortune, in the form of unexpected contingencies may cause a temporary check, but breeding must tell in the end, and therefore, if he determines to avoid reckless experiments in crossing, and to stick to the best blood, a man should have full confidence in investing capital in horses.

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Poultry House Construction.

It is very easy for one who has a taste for architecture, even if that taste has not been trained or developed, to sit down and plan elaborate poultry houses, in which are conveniences of every kind for the comfort and welfare of the fowls that are to be housed therein.

This sort of work is all well enough, but the fact remains that the most skilful architect cannot build a poultry house which is suited to practical use without having had some experience of a practical kind in housing poultry.

Some of the most impractical poultry houses we ever saw were beautiful to look at and were built with a view to meeting every requirement of the fowls, but they failed in important particulars to be planned along the right lines.

In building a poultry house there are a few elementary principles that should not be lost sight of in an effort to make that look complete. We should try to make a point of view of the fowls, if we will for a moment admit they might have any notions of the subject.

To do this we must first learn what is more essential to their complete comfort. Once we learn what we require for comfort we may plan for them in the hope of being able to build a house in which they will live and thrive in the greatest comfort.

Fowls care nothing for architectural effect. All of this that is displayed on a poultry house is of no use further than to please the eye of the owner. The most comfortable poultry house we ever saw was dug in the side of a hill, and two boys did all the work. It was not beautiful to look at, but some Black Spanish fowls lived in it without suffering from cold, darkness or lack of pure air.

Permanent inside fixtures of any kind should be dispensed with as far as possible. Stationary eedee jrebncx sordhs puch inside arrangetmen should be so made that any or all of them may quickly be taken outside when it is desired to whitewash or thoroughly clean the house.

The perches may rest on trestles and be perfectly adapted to the use for which they are intended. Perches may be made of ordinary shingling lath 1 x 2 inches, the upper corners being rounded to fit the feet of the fowls as they sit on them. They should be about eighteen inches part and nine or ten inches of perch extended. This platform may be laid on the trestles before referred to without being fastened in any way If the perches are nailed to a piece of timber 2 x 8 inches in such a way that the timber will support the perches eight inches above the dropping board it will be found a very convenient arrangement. The perches eight inches above the dropping board allow the droppings to be scraped off with a common garden hoe.

Whether a board or an earthern floor is used is largely a matter of convenience or location. Where a dry earthern floor can be secured it is no doubt the best one that can be got.

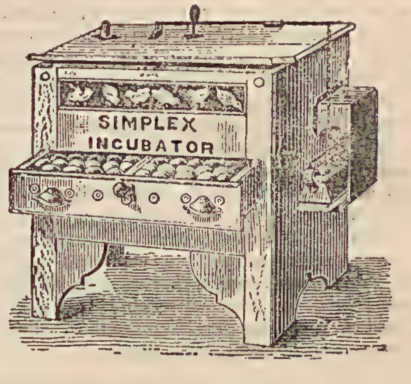
As to light and ventilation the canvas covered windows seems so supply all that is needed. Stout sheeting is often used in the place of canvas and has been found serviceable. The windows should be as large as possible and face the south.

A cheap grade of lumber covered with good building paper and painted with good tar makes a very serviceable house. When applying the paper begin at one side of the roof and run the paper to the ground on the other side of the house, whether the roof be double or single pitch. This closes the house perfectly and leaves no air space under the eaves to create drafts and invite disease. Such a thing as over-hanging eaves are of no use in a building of this kind. If desired a double wall may be used, but it is not necessary if the perches are surrounded by a curtain of burlap or other similar material during the cold months. The curtained sleeping place has come to stay. It gives the fowls a closely enclosed room in which to sleep and at the same time gives the neccessary ventilation, the air penetrating the cloth easily but in such manner that no drafts arise. The curtain should extend to the roof. With cloth windows instead of glass and a curtained sleeping place the problem of ventilation is solved.

Give each fowl four square feet of floor room and an opportunity to run out of the doors in all but the worst weather, and such a house as is here indicated will meet all the need of a flock of fowls in the way of maintaining health and comfort.

Of course there is no objection to ornamentation glass windows and modern appliances of every kind, but these may be supplied or omitted without in any way intertering with the usefulness of the house or the health, comfort and productiveness of the fowls.

Mr. John Paine wishes to intimate to the residents of Unley and surrounding districts that he has opened premises at Unley road, Unley (in the establishment lately occupied by Mr H. Cooke), as hairdresser and tobacconist, where he hopes by attention to business to merit a share of public patronage. Cleanliness and civility strictly maintained. Mr Paine has furnished his shop with a stock of choice cigars, cigarettes, and tobacco.



Simplex Incubator.
D. Lanyon, RUNDLE STREET KENT TOWN, S.A.

Summer Houses for Fowls.

(By Fred Grundy).

In the good old summer time is when thousands of fowls suffer the tortures of Hades from bad housing. The interest of their owner wanes as the egg supply diminishes, and he begins to "let 'em rip" and look out for themselves. In looking out for themselves, they lie about in the shade through most of the day and at night return to the mite-infested perches to pass the few hours of darkness about as one would pass it in a bug-infested bed. Quite often the house is closed same as in winter, and not cleaned out once a month, and naturally the air is about as foul as it well can be.

Of course, these conditions are not found in the houses of anybody that reads this article. At least we will say they don't. Yet, nevertheless, I would be quite willing to venture a bottle of cologne that there is room for a considerable improvement in the poultry houses of nine out of ten of all the readers of this paper this very minute. The excuse most often given is that it is an awful job to clean out a poultry house in hot weather. This is all fol-de-rol. Get up just before the sun, and having left the doors and windows of the house open all night, go at the job while the grass is still wet with dew, and after it is done you will conclude that it was only a little shore after all.

The best plan of housing fowls in summer is to put up perches in the scratching sheds and shut them out of the house at night. They will be slow to take these new perches, probably, but they will finally do it. If two or three of the quietest are placed on these perches the first night they they will return to them the following night and the rest will soon follow. Some writer's advocate sending them to the fences and trees, but it is not a good plan. By having them roost in the scratching sheds it is a very easy matter to get them to return to the houses when weather becomes cooler in the fall. If they roost in the trees and on the fences all summer one will have a fighting job every night for a week or more to get them into the houses. Then it is a bad idea to have them exposed to storms, even in summer. The rain comes comes down from a cold quarter and drenches them, and sometimes continues all night, and they come off their perches in a miserable state.

It is but a small job to put up temporary perches in the sheds; any sort of old boards, poles or rails will do, and when one is done with them for the season they can be quickly moved out, the sheds brushed out, and things made ready for winter. I am well satisfied that fowls pass moulting season and reach autumn in much better condition when compelled to pass the summer nights in open sheds than when kept in houses, even if the houses are kept clean. In case one does not not have any scratching shed, and there are several thousands who never saw one, the next best thing to do is to open the doors and windows wide and keep them open day or night. Keep the floor clean by raking and brushing it out once a week and at the same time give the entire interior, walls, floors, ceiling and perches a good spraying with some mite destroyer and disinfectant—something that will actually kill the mites, and something that is a real disinfectant and not merely a perfume. If this program is thoroughly carried out, and the birds given proper care, otherwise there will be no sick fowls, and they will come through the summer in fine trim for doing some business in the late fall and during the winter.

I just have a letter from a man who asks what sort of treatment fowls ought to have in summer to prevent them from dying off "like his do." The foregoing pointers will show him what he should do in the matter of housing. He says his birds are kept in a small yard all the time, because he has no range. In that case I would try to give them green food every day, if it can be obtained. And every day I would turn over a few spadefuls of earth in their yard. There is nothing does yarded fowls more good than a wallow in freshly turned earth. When they do not wallow, they will scratch and enjoy it just the same Half a dozen spadefuls a day is sufficient. If he does the digging in the morning before he lets them out and buries a little wheat, broken corn or any sort of grain, mixing it with a little grain, mixing it with the soil he turns, they will scratch all the more, and it will be a pleasure to him to see how they enjoy it I judge the reason his fowls die off is because they have nothing to do, no fresh earth to mix in, no pleasure of any sort, nothing to do bnt eat, drink and stand about, changing feet for exercise.—Exchange.

Even the very commonest kind of mongrel poultry can be improved not only in appearance by the introduction of purebred male birds of a good type, but in two or three years a strain of fowls can be established that will possess desirable market and egg-producing qualities. In order to accomplish this improvement the old mongrel male bird should be disposed of and also all birds which are not in a healthy, active condition, as well as hens which are over two and half years old. If it is a large flock running over a big range one cockerel for every dozen hens should be procured, but a better plan is to select 10 to 12 of the best hens and keep them with a purebred cockerel in a separate pen, and to use the eggs from this pen only for hatching

One thing is often lost sight of, and that is, that the life of a bird in its natural condition is essentially a very active one, consequently when birds are domesticated part of their food should be buried in the earth to give them plenty of scratching exercise. This will keep the birds in better health than snything else beside, because it is Nature's own plan for infusing life into animals ond birds.

Gapes generally attack chickens between the ages of six and eight weeks, and hardly ever after four months old. A good remedy is a small piece of camphor about the size of a grain of wheat daily.

Indian Runner Ducks.

Where a free range can be had, this duck is unequalled as an egg producer. Commencing to lay at an early age (between five and six months), it continues regularly right through the autumn and winter, even during the coldest weather. Being particularly hardy, both the ducklings and the mature birds thrive wherever they have the liberty; in confinement, however, they do not succeed. This species will obtain the greater part of its living, being an excellent forager, roaming about all day in search of worms and slugs. The young ones get their adult plumage at about six weeks of age, and mature so quickly that they are ready for the table at about eight weeks. This is not a large duck, but being small in bone. has plenty of meat on the breast, and the flesh is of fine flavour. The eggs of this bird are large, considering its size. Pure bred Indian Runners have a long neck; the head bronzing-green, with a narrow line of white encircling the base of the beak at its junction with the head: shoulders, back and breast fawn, the upper part of the drake's breast being tinged with reddish-brown, while that of the female is dark brown, the feathers being edged with fawn. The wings are white, the legs are orange-red, and the beak dark green. When on the move this bird runs very fast, holds itself very upright, and has not the waddle so characteristic of most waterfowl.

In the production of market poultry one breed is enough, if it is the right one. Even when one has made every provision to keep them separate and confined where they belong, they are a source of care and trouble to the farmer who has many irons in the fire. With one breed the owner has less bother and the fowls are more comfortable with large range and less confinement.

The Simplex Incubator, one of the best in the market. can be procured from Mr. D. Linyon, Rundle-street, KentTown, S.A.

A farmer sued a cyclist for three shillings damages on account of the latter having run over a goose The cyclist offered to pay two shillings. The judge settled the case in this monner:—

"You want three shiliings, and will hand over the goose. My judgment is that defendant pays the two shillings. I will pay the other shilling out of my own pocket, and my man will carry the goose to my house. In this way everybody will be satisfied."

In any undertaking where measurement is concerned it is most important, and in many cases absolutely indispensable, that the measuring instruments used must be correct and reliable This applies to incubating as well as to brewing, wine-making. preserving it, etc.—in fact to all operations where precise measurement is an essential factor in the attainment of successful results. Success in incubating is practically dependent on the thermometer registering correctly. The name of Sawtell has been associated with correct measuring instruments for over half a century, and Messrs. Sawtell being specialists in this particular branch of their extensive optical business,—therefore if you require instruments for practical use, such as thermometers, hydrometers. barometers. compasses, binoculars, and scientific instruments of every description for all all purposes, you are advised to communicate or call and inspect their stocks. Their special line of correct incubator thermometers at 3s 6d each can be recommended. Repairs and adjustments to all scientific instruments, grinding of sphereo-cylindrical lenses and spectacle making is executed on the premises. Address—Sawtells', opticians, 67 North terrace, and Divett-street, Port Adelaide.

Poultry Notes.

Culling the flock of youngsters is one of the important duties. Weed out the useless ones often.

Many a good bird has been spoilt in the brooding. Neglect at that time can never be remedied.

It is time an effort wasted to try to bring to maturity chicks that have been hatched from eggs laid by debilitated parent stock.

Never try to raise deformed chicks. They should be killed as soon as hatched.

Many women succeed with poultry as a business undertaking, but it is one requiring little ability. The women who succeed are of the kind that would gain success in the average business venture.

If breeders who keep their fowls confined in small yards would remember that chickens must have grit and supply it in some form there would be less loss from unknown (?) diseases.

Better a dozen hens that lay,
Than scores that just stow grain away.

Careful selection for the best layers should be made, so that each wasteful element is gradually taken away to make room for new birds that produce and give good return for everything expended. Some poultry-keepers are too hasty in sending away their birds and sometimes some of the better birds are disposed of, and thus the good they might have done is lost to the owner.

When selecting eggs for incubation, whether in an incubator or under hen, choose those that are of good shape and uniform in size. Undersized eggs produce undersized chickens which are generally weak. Always choose eggs from small, healthy fowls, that have been fed properly for proper egg production.

Miss Thompson, costumiere, has opened a high class dressmaking business at 142 Pulteney-street, Adelaide. This lady has acquired a reputation for exactitude and promptness in the execution of orders entrusted to her. which are turned out in a stylish. novel, and attractive manner. Ladies desiring a perfect fit cannot do better than accept Miss Thompson's invitation to give her a trial. One of the recommendations of the establishment is the reasonable rates at which the work is performed.

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The December Number of . . .

The Australian Gardener

CONTAINS—

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Fern Culture
Ideal Country House

The Orchard—

Operations for November

Agriculture and Stock—

Rotation of Crops
Farmers Orchard

The Poultry Yard—

Poultry Notes
Eggs
Utility Birds
Fattening Chickens

Flower Garden

Operations for December.

Daffodils and other members of the narcissus family may be allowed to remain several years without removal, if the bulbs have been planted sufficiently apart and the soil is in good condition. The usual practice is to remove them to new quarters when they have been grown for three years in one place. Whether they are to be lifted or not, to insure good flowering bulbs for the following season, the plants should be kept free from weeds, and the soil well cultivated, a light dressing of bonedust worked into the soil round the bulbs being decidedly beneficial. The object should be to keep the tops growing as long as possible, this extended period of growth being the factor that will produce fine blossoms in the following season. Hyacinths and tulips, unless grown in beds separately from other plants, should be lifted each season. They will not tolerate water during the resting period, and it is safer under any conditions to lift the bulbs.

Tea-Roses and many of the hybrid teas, also, should be well thinned out after flowering in spring. These plants usually develop an excessive number of shoots on the branches that were allowed to remain after the winter pruning, a number of which, if allowed to grow, would crowd the head and spoil the symmetry of the plant. As a rule, these shoots are, or should be, rubbed off as they appear; but if allowed to grow and bloom, should be entirely removed afterwards. Old, weakly wood should be also cut away if a good shoot makes its appearance in a position that will fill the vacant space. While thinning and reducing the plants they should be examined, and if found to be affected by aphis, black spot, or mildew, should be thoroughly sprayed with Nikoteen, or some such wash, for the aphis, and potassium sulphide solution for the fungi. The latter should be used at a strength of 1 oz. sulphide to 3 gallons of water. The sulphide should be dissolved in a small quantity of hot water, and afterwards diluted with water in which soap has been dissolved; otherwise it will not spread over or adhere to the foliage.

Chrysanthemums grown for large blooms should have the top of the shoot pinched out if they have not broken into lateral growth naturally, and three or four shoots only retained on each plant and securely staked. Where the plants are grown for masses of bloom, they may be cut back well, which cutting will insure dwarf sturdy plants.

From the middle to the end of the month of December is early enough for the general planting of dahlias in the metropolitan districts.

Plants of various annuals and perrennials about to bloom will be greatly benefited by the application occasionally of liquid manure. A simple and effective solution is made from sulphate of ammonia or nitrate of soda, 1 oz. of either dissolved in four gallons of water having a decidedly beneficial effect on the flowers, and also prolonging the blooming period.

Vegetable Garden.

Where early crops of beans, etc., have been gathered, the ground should be manured and prepared for the reception of young plants of cabbage, celery, and other vegetables from former sowings.

Seed of beans (dwarf and runner), late varieties of peas, cabbage, celery, lettuce, raddish, melons, etc, may be sown according to requirements and district. Butter or wax pod beans are to be preferred to the ordinary French beans. They are stringless and of good flavor. Canadian Wonder is the variety of French bean most popular with the market gardeners.

Lettuce should be sown where the plants are to remain at this season, as they do not transplant well in the dry weather. A cool, moist spot should be chosen if available.

As tomato plants grow they should be tied to stakes, and lateral growths removed, leaving not more than two or three shoots to each plant; in fact, it is claimed that better results are obtained by closer planting and leaving only one stem to each plant, from which all lateral growths are removed as they appear. When the fruit is set, the plants should be mulched and liberally watered. The hoe should be kept going between the rows and weeds carefully kept under, especially such as shepherd's purse, that is capable of fostering diseases that attack the cabbage and allied plant

Orchard Operations.

By James Lang.

Owing to the unusually cold weather during the past few months, vegetation of all kinds is in a very backward state. Fruit trees of all varieties are quite three weeks later in blooming than they usually are: this will make the fruit much later in maturing. Those growers who intend to make consignments of apples to over-sea markets will have to bear this fact in mind when making their engagements for shipping space during the ensuing season. The export season generally starts early in February, but this season the apples will not be sufficiently matured to ship till the end of February, or beginning of March. There are always complaints of the early shipments arriving in poor condition in London owing, in some cases, to the fruit shrivelling and also to the development of bitter pit on the voyage. These conditions disappear in the latest consignments, when bitter matured fruit is sent. When the first lot arrives in indifferent condition, it helps to depress the market for succeeding shipments, as buyers become very cautious as to the price they pay. It will therefore be better, especially in a late season like this, not to ship fruit too early.

As the crop of apples and pears is likely to be very large throughout the State, growers will act wisely in exporting as many as possible of the most suitable varieties. This will also relieve the local and Inter-State markets to a considerable extent, and secure a better all-round price for the fruit.

Ploughing and scarifying will be the principal work of the orchard for the present, to keep the weeds down, and leave the surface soil in a loose and friable condition.

Newly planted trees should be looked over and all unnecessary and misplaced shoots rubbed off. The tree then puts all its strength into the shoots that are left, causing a much stronger growth. Grafts on old trees also should be looked to, and firmly secured to prevent blowing off by high winds. If not already done, bandages should be placed on apple and pear trees to trap the grub of the codlin moth. Spraying will also require attention during the month both for the moth and fusicladium. The arsenite of lime recommended in last month's orchard notes can be combined with the Bordeaux mixture, thus obviating the necessity of a separate spraying for each pest. It can also be used with kerosene emulsion for the mussel scale on the apple and pear. Where curl of the leaf is showing on the peach trees, spray at once with the Bordeaux mixture.

Keep strawberry plantations clean and free from weeds by hoeing, also place straw or other material round the plants to keep the fruit clean.

Gooseberries and currants give promise of a good crop, and the cool weather conditions prevailing should swell them out to a good size.

Fern Culture.

Fern culture is a subject far too extensive to be treated in anything like a comprehensive manner in an essay such as this, so I will not attempt to go into the matter fully, but will take up that portion relating to greenhouse culture, which, I think, will be of more interest to the majority here.

Propagation by Spores.

The raising of ferns from spores is at once the easiest and most convenient method of increase with varieties that adapt themselves to this means of propagation. This with some of the varieties requires strict observation and some little experience to catch them just at the proper stage. Though as a general ripeness is indicated by the sori turning brown or beginning to shake off, some of the genera, notably the davallias, shake their spores much more readily than others, and the inexperienced are often apt to delay too long and gather, instead of ripe spores, fronds with but empty cells. The fronds when gathered should be wrapped closely in paper and laid in a dry, warm place for a week or two until thoroughly dry, after which the spores can be readily shaken off. The general opinion is, that the sooner they are sown after being thoroughly ripened the better; and although not usually necessary nor practical to keep them for any length of time, I have sown spores of Pteris tremula that had been wrapped in paper for 2 years with satisfactory results.

Another somewhat difficult matter is to procure sports of the individual varieties true or unmixed. Fern spores are of such a light nature that the least breath of air will carry them all over the house, the spores of one variety finding lodgment on the fronds of another. I have sown spores from adiantum fronds and reaped instead of adiantums an excellent crop of pteris where the spores had got mixed in this way; the adiantums spores were there all right, but the pteris being the stronger growing and quicker germinating variety it was a simply a case of the survival of the fittest. The lesson thus learned is to keep the varieties by themselves and as far away from others as possible for some time previous to the selection of spore fronds.

Preparing the Seed Pans.

The next thing is the preparation of the seed pans. These should be thoroughly cleaned to insure that no germs of moss or fungus are left lodging around. A great deal of what is known as damping off has its origin from this source, being the work of a minute fungus. Fill the pans about one-third full with crocks, larger ones in the bottom and those on the top finely broken; over this place a layer of moss, then fill to within an inch and a half of the top with the ordinary potting soil. Over this place half an inch of soil, which has been subjected to a baking process long enough to kill all vegetable in it. This insures against the growth of moss, which, in unbaked soil, would be more rapid than that of the ferns and prove a source of considerable trouble. This baking of the soil was at one time one of the secrets of fern cultivation, but it is now pretty generally practiced. The surface soil in the pan should be pressed down and made as smooth as possible. A good soaking of water should be given and allowed to drain off before sowing the spores. Sow these thinly, very thinly. The spores being very minute, it is an easy matter to sow too thickly without being aware of it. Don't cover the spores, but leave them on the surface of the soil; and place over the pan a close-fitting pane of glass. The glass must be turned frequently to prevent the moisture from dripping, which would throw the spores all into little bunches. Water must be given from the top, but the pan should be set in a saucer which should always be kept full and from which sufficient moisture will be drawn

The best place to start the spores is in a close atmosphere, in a bottom heat of from 60 to 65 degrees. Shade should be provided during the day, but should be removed when the sun is not shining directly on the house. In

from ten days to three weeks, according to the variety, the surface of the pan will assume a green, mossy appearance. This is produced by the prothalli, which as they become larger will be seen to be small heart-shaped bodies. These in due course produce sexual organs—the antheridium and archegonium—which correspond to and perform the same functions as stamens and pistils do in the higher orders of plant life. As the antherozold (or what might be called the pollen part) ripens it breaks up and is carried around by the influence of air or water, and in this way is conveyed to the archegonium through which it reaches the oospore and fertilizes it.

The difference of the time needed for the maturing of the sexual organs of the different varieties would require to be systematically studied by microscope to give a fair chance of bringing about a cross, but this is hardly within the sphere of the ordinary gardener who has to plod along by rule of thumb and take his chances of striking it by accident; no doubt many of the varieties now cultivated have been thus produced.

The crested and variegated forms are mostly the results of sporting, which is the only other means by which new varieties are produced. If the spore have been thinly sown it may not be necessary to transplant until they begin to throw up the little fronds, though they generally require transplanting before that stage is reached.

For this transplanting shallow flats are the most suitable, a loose, sandy compost being provided. They should be lifted in small bunches on a wooden label which has been rounded and thinned down on one end for the purpose. The back of the label is pressed down into soil sufficiently to make a little hollow receptacle, and when withdrawn from below, leaves the little clumps in proper position without having to be touched by hand; they being of a very fragile nature the least touch will bruise them. Some don't believe in watering at this stage, but I make it a practice to sprinkle them lightly with water after transplanting, and find no bad results from it. I always, however, use water at a temperature of about 65 degrees. Covering with glass will be necessary for some time after transplanting, but the covering should be gradually removed as the little fronds gather strength. Shading must be strictly attended to through all this stage of their growth, as a few minutes' sunshine would work irreparable damage. They must also never be allowed to suffer from dryness.

When the plants begin to get crowded they should be potted up into thumb pots, using a compost of loam, leaf mold and sand, in about equal portions. The plants need not be singled out individually, but if potted four or five together will make serviceable plants much quicker. For subsequent pottings (which should be given just as soon as the pots they are in well filled with roots) a rather heavier, moderately enriched soil should be employed.

Raising from spores is by far the most convenient way of keeping up a supply of small ferns, the demand for which seems to be rapidly on the increase, they being extensively employed for filling fern pans, small vases, etc., for house decoration. The demand for certain classes of plants or flowers is apt to be controlled to a greater or less extent by fads or fashion, but the fern pan seems to me to be one of those things that is going to be lightly cast aside, for when my lady buys a nice pair of ferns she knows she has something that is going to last, and look well for some time, whereas she can spend as much money for a bunch of flowers which to-day is and to-morrow is cast into the ash barrel. So, to maintain my lady's interest the chief consideration in the selection of varieties should be their standing qualities. This combined with gracefulness of frond and compactness of habit gives an ideal fern for the purpose in hand; stiff heavy leaved varieties should be avoided. If I were to enumerate all the varieties suitable for the purpose I have no doubt they would fill a good-sized book. But I am sorry to say that the varieties generally met with are not numerous, a few seem to be run on, and few of the growers seem to make a break to get away from the old rut. I am sure it would pay the grower who would have enterprise enough to keep on procuring and trying varieties, for there are hundreds of old ones to pick from which are worthy of a trial.

About six months from time of sowing is usually required to give useful sized plants in a night temperature of about 60 degrees and a day temperature of 75. In stronger heat they could be grown in shorter time, but it does not pay to rush them as they would not be so compact and bushy, and would, of course, be much softer. Successful batches should be sown as required, as they soon become too large, and if confined for any length of time in small pots they assume a stunted and sickly appearance.

Where larger plants are wanted they should be kept moved up as they need it and receive as little check as possible, as the size of plants doet not depend so much on age or size of crown as is does on length of frond, and to procure this the chief agencies are intensive culture and quick growth. Most ferns can be materially assisted the application of liquid manures, but these should not be applied unless the pots are pretty well filled with roots, otherwise the residue not utilized by the plants would have a tendency to clog the soil and cause sourness.

Most ferns adapt themselves to propagation by division, but this is a slow method with some and when they come readily from spores need hardly be practiced. Some, notably the nephrolepis, can be propagated very rapidly by offsets, and some, notably the Adiantum Farleyense, can only be propagated by divisions of the crown. This latter variety is one of the most beautiful ferns we have, though one that is rather difficult to grow. One of the chief causes of failure with it is the lack of heat in Winter. It requires a temperature of not less than 65 degrees to keep it growing even slowly. If subjected to a lower temperature than this the plants become stunted and it is next to impossible to get them back into a healthy condition, even with the higher temperature of Summer, without breaking them up and beginning all over again.

All ferns require shade to a greater or less extent, but it is a very common mistake to have the shade too heavy. This causes drawn-up, weakly growth, and in a good many cases spoils the individual character of the fronds. Further than to prevent this shade is unnecessary. Fresh air also plays an important part in maintaining the health of the plants. Although a dry atmosphere is not congenial to their well being, nevertheless fresh air is necessary to maintain

Rhododendrons.

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strength of growth. When fire heat is being used more atmospheric moisture is needed and can safely be given by frequent sprinkling of the pathways and under the benches of the house. But, as soon as firing is continued the atmosphere of the house naturally becomes charged with moisture, and it is then necessary to keep air on both night and day to prevent condensation. When condensed moisture settles on the fronds it is sure to cause damping, especially to the younger and more tender ones, and when damaged by damp in their earlier stages they never develop their true character,

In conclusion I would like to say a few words in favor of the more general use of hardy ferns for beautifying the surroundings of the home. These adapt themselves to filling the corners where few others would thrive, and we have a great many beautiful native varieties besides a number of foreign sorts that are quite hardy in this latitude. They will grow and thrive in any shady corner as long as they are not under the dense shade and drip of trees. Many a corner that is now an eye-sore could be made beautiful by erection of a rockery and judicious use of hardy ferns. The expense would be a small item, as stones are not hard to procure and the rougher they are thrown together the better they will look.

The Ideal Country Home for the Man of Modest Income.

No. II

THE walks might be of soil and leaves, pine needles or tan bark, and as a grass edging would be stiff, and wasteful of room as well, carpets of moneywort—Lysimachia nummularia—will form a delightful, irregular margin, and when in bloom is covered with its yellow flowers. By sinking an old hogshead in one corner and making occasional use of the hose, we have the ground work of a water garden where nymphæas may bloom amid Iris, myosotis, mallow and aythrum, with a backing of the water-side cephllanthus, clethra and arunno.

From the wild garden, by an entrance arched with clematis and wistaria, we pass into the flower garden occupying the rear portion of the lot. Here all is formal. A neat hedge of privet encloses it, and the space within is laid out in straight walks and rectangular beds filled with flowers. Here the old fashioned hollyhocks, digitalis, delphiniums, tiger lillies, iris, roses, peonies and phloxes reign supreme, as they have for centuries in such gardens before us. The new and improved forms of each let us have, by all means, especially in the phloxes, where the strides both in purity of tone and size of flower are amazing. Let us also have roses in abundance—hybrid perpetuals, hardy teas and hybrid ramblers the latter best grown with some support. Harrison's Yellow is an especial favorite of all rose lovers. The spaces left we can fill with such plants as the poppies of many sorts, Perennial and annual. I often wonder why more people do non grow the latter. The Shirley poppies are charming, but are cast in the shade by the splendour of the great double farms of poppies sold as the Mikabe, thn American flag, and other high sounding, but in this case justifiable titles. For blues, we will have Baptisia australis, distressingly short-lived though its lilac flowers be: Iris germanica and sibirica, the latter the most decorative of irises when well grown, though Iris Kænpferi's flowers excel in size and depth of coloring; Campanulas grandiflora, rotundifolia and persicifolia Aquilegia ooerulea, Veronica longifolia subsessilis, hardy asters and Stokesia cyanea. In pinks and whites are the Dyanthus group, D. arenarias, barbatus and deltoides, Lychnis viscaria fl. pl., Pyrethrnm hybridum and uliginosum Achillea ptarmica the pearl, liatris and Sedum spectible. For yellow there is anabundace to choose from in the composite family alone, beginning with the early flowering Doronicum excelsum and the coreopsis, and ranging through Rudbeckias hirta.

Arbors and trellises against the house will give space for growing wistarias, climbing roses, actinidias, and other vines; and if there be a board fence along the back of the lot, it may be made beautiful with clematis in many sorts, the rambling yellow Jasmnum nudiflorum, one of the Spring's pioneers, briar rosei, annual cobæa and the grand old passion flower, Passiflora cœrulea.

But let us pass through to the fourth or north side of the house, which, if the building be well located, will be but a narrow strip of land, twenty-five or thirty feet wide. Through it the walk to the kitchen door should run, the space being least valuable here. That leaves room enough still for two shady borders in which to plant shade-loving shrubs, flowers and ferns. Of bushes there are the native Symphoricarpus vulgaris and racemosus, of value chiefly for their pink and white berries. The latter, S. racemosus, was the wax berry of colonial days. For brightness of flower there is nothing to equal the azalea, which will do nicely in such location, and Azalea nudiflora, the common wild pink azalea of our woods, is as charming as any.

In the foreground would be the low-growing forms, the lovely pink A. Vaseyi, just the shade of the old Daybreak carnation, the darker Azalea nudiflora and the large-flowered Ghent and mollis hybrids, shades of orange and yellow, chiefly. Behind them the taller A. arborescens viscosum and calendulacea, the latter the flame azalea of the Southern mountains. Space, too, there is for the pretty lavender Rhodora densis, a close kin, botanically, to the azalea. For evergreen plants to associate with them, there are our native Rhododendron maximum and catawbiense, cheaply obtained, and both very beautiful. So, too, of the native Kalmia latifolia (laurel), one of the most beautiful of all broad-leaved evergreens, unexcelled by the classic laurestinus itself. For variety, a few plants of the dearer hybrids are worth trying if your purse can afford it, though they are thankless fellows, apt to repay your greatest pains by succumbing to the first cold Winter. More satisfactory are the Andromedas japonica and floribunda, especially the former, which is far too seldom grown. Leucothoe Catesbaei, a low-spreading bush, with leathery leaves and racemes of white flowers, is charming, and easily handled, as is also Ilex crenata, the Japanese holly. Conifers we do not need, as the space is insufficient for their proper development, and they succumb so often to the dust and soot of the suburbs.

Such a half acre is by no means an impossible dream, nor is there fear that it would look cramped and crowded, for we have but carried the division of the house into rooms out into the garden. It need not cost a fortune in making, if the owner will go systematically about it, and use his opportunities. The soil, of course, must be well prepared by deep digging, and be well enriched. Many hours must be spent in gathering and establishing the plants, whether they be bought in nurseries or collected in the woods and fields. But, after all, many a man spends almost as much money on a useless stone wall along his property front, a wall too low to screen either from within or without. And will it not be worth while? Not a moment of the year will be without its interest in such a garden home, from the first breaking of Spring, when the bulbocodium is pushing up its green nose, watching for a warm day to open its pink flowers, with their odd, strap like petals. Every day there is some new arrival to greet you. The yellow crocus will follow in haste to profit by the opening of the season, and not long after the white and lovely violet-colored form named after Sir Walter Scott. Meanwhile, by the pool, our old friend, the skunk cabbage (Symplocarpus foetidus), a sort of stout, matronly old party, as it were, who arises betimes, has been up for some time, and no doubt may be in full bloom already, though this is a matter of interest more particularly to the symplocarpus itself, as the blossom is quite hidden in the purple-green sheath. Then comes a long array of tender little things, bulbous for the most part, headed by the cold blue squill and its companions, the warmer colored Chionodoxas luciliae and gigantea, the glories of the snow of our fathers.

Then the shrubby things in the dooryard begin to be heard from, spiraea, cydonia,

PORTUGUESE LAUUEL—Laurus Lusitanicus

This magnificent tree shows in full bloom, with long racemes of flowers, snowy white, 6 to 8 inches in length, is probably the oldest and finest of its kind in the country. Usually grown as a shrub, the subject of this illustration is some 25 feet in height, planted at the residence of the late Judge Gwynne, at Aldgate, South Australia.

barberrry vieing with the narcissus and the tulip in the wild garden for our intererts; and presently the place is a veritable fairy land of life and color, from the unfolding leaves of the tiny Nympaea pygmaea, in the pool, to the nodding trumpets of the tecoma, mounting skyward on the walls. And so it goes until frost cuts off the lingering flowers of chrysanthemum geranium, dahlia and aster. Remember, too, I have not exhausted, but just touched upon the field open to him who cares to try my recipe for a garden home.

The Farmer's Orchard in Victoria.

BY C. BOGUE LUFFMANN.

Orchards are wanted as protection, as aids to beautifying the surroundings, and as direct sources of profit. But as the country is not all expossed, barren, and unsightly, fruit trees must for the most part be set out with the object of their yielding a direct return, and thereby adding to the value of the farm.

The selling of fruit is scarcely less than a problem to many, and it will never be wise to set about the planting of an orchard in any position until it is clearly seen where the markets are, and how far it will be practicable to reach them with the produce of no more than an acre or two. As a matter of fact, small parcels are of value only when offered in small local markets, and if producers are many and local consumers few, there can be no profit in the venture—that is, apart from its value to the home and farm-yard.

Under the most favourable conditions of soil and climate, the farmer's orchard may be large, and yield a higher average return than any other branch of the estate, since, where animals are kept and systematic manuring is practised, the ground and trees yield more and more, and earn an ever-increasing market value for the property.

A Direct or Indirect Source of Profit.

The farmer's orchard may, therefore, be a direct or an indirect source of revenue, according to his position, his native capacity, and general plan of operations. Thus we see many fruit-growers turn farmers, and also farmers turn fruit-growers; and, further, some employ a few trees as a hobby, and extend the planting to scores of acres. Everything depende on personal ability to manage trees. Their ways and wants are not so easily understood as are those of cows or pigs. They are of lasting value or are lasting nuisances according as they are understood and cared for, or go unconsidered and uncared for. So, again, one has to say, let the farm orchard be of a size in direct accord with one's knowledge of its wants. Victoria does not really want more fruit trees for its present or immediate population, but more skill in managing the present stock. Skillful orchardists are extremely rare amongst the unsettled population, and if a farmer is not able to discover and direct the necessary work of the orchard, it is doubtful if it will prove genuine source of profit.

This somewhat lengthy preamble is necessary in order to save those who, seeing others succeed with trees, think that the task is an easy one. Let the farmer who contemplates planting an orchard of any size first read the earlier article on this subject; then a good book on soil, as are those by Hall, King, and Roberts; also a good standard book on fruit-growing, as Bailey's "Principles," Bunyard's "Fruit Farming," and, for the warmer parts of the State, Wickson's "Californian Fruits," True, these books do not exactly fit in with Australian conditions and wants, but they hold a lot of solid foundation material, and, if well studied in conjunction with local experience and practice, any man equal to managing an orchard will receive sound support from them.

The Value of Local Experience.

But perhaps the safest and surest guide is the methods pursued by a successful local man, for, since all good books are the outcome of experience, we shall always find that a man who is succeedsng has a great deal to teach others if they will only be modest enough to take it. Busy and successful men have no time to say how it is done, but they do not object to our looking over their fence, and as a glance is as good as a stare to those of the right fibre, the results of every good local effort are plain for all to see.

As the methods of preparing ground, selecting, planting, and protecting of trees were dealt with in a former article, no more need be said than what is absolutely essential to the three cooler zones of the State.

The Coast Region.

The price of country lying between the shore and the foothills of the Dividing Range is so vast and varied in quality, position, and climate as to allow of the growth of every kind of fruit common to the whole State; but the farmer who would have an easily-managed and safe little orchard should confine himself to apples, pears, plums, and a few bush fruits. If very near the coast, and a really warm soil and position, a few lemons and oranges may be possible, Peaches and apricots will also thrive where it is warm enough for lemons: but the greatest care is often necessary in selecting both species and varieties in order to insure free growth and regular fruiting. Always supposing a vegetable and flower garden such fruiting plants as grapes, almonds, oranges, lemons, strawberries, the bush fruits, figs, cherries, and quinces may be well regarded as decorative features of the home, and the true orchard area reserved for the more vigorous tree fruits.

Comparative Value of Different Fruits.

Of these, the apple is the most valuable; next the pear, and then the plum. Under average conditions, about 100 trees stand to the acre, and in devoting such an acre to an orchard one should make up the numbers in this way:—Fifty apples, 30 pears, 20 plums. Should peaches and apricots be known to thrive, and included in the 100, then the list should be as follows:—Fifty apples, 20 pears, 10 plums, 10 peaches, 10 apricots. With a two-acre orchard or extent to accommodate 200 trees, at a given distance, the additions should be in the way of increased quantities ample for the average home. Thus, a two-hundred tree orchard should hold 130 apples 30 pears, 20 plums, 10 peaches, 10 apricots. Many circumstances may occur to alter the relative figures in these lists, as where soil is too poor for apples very good pears may be grown; hence they may lead in point of numbers. Again, plums are of unequal value in different districts, and, unless they are wanted for preserving in large quaniities, or it is known how to convert them into prunes, they should be sparingly grown.

Guides to Selecting and Forming Trees.

As the soil and position vary, so must the strength and build of the tree. For open and trying positions put in none but really vigorous, upright kinds, and for rich soils in protected situations choose rather long-trunked and light wood-forming kinds. Good nurserymen are only too glad to supply what is asked for, providing they are asked in time, and it is often necessary to order trees to be made for a particular situation in order to secure the very best results. Of course, there are ways of strengthening weak trees, and weakening over-strong ones; but for those who do not devote all their time to the study of the orchard it will be at last necessary to start with trees well adapted to meet the conditions.

Conditions for Planting.

Trees which lose their leaves in autumn may be transplanted at any time between this period and spring: but, in a general way, they are best planted in autumn or early winter—say, May and June. But if soil is at all wet, cold, and our, the trees should be kept "heeled in" in as specially prepared bed till the worst winter weather is past.

Pears and plums have the hardiest roots when it is an affair of resisting cold and wet; hence they may be set out when they arrive; but apples are more sensitive, and peaches, apricots, and lemons particularly so, and by far the best results are obtained in cold districts when they are nursed through the winter and set out very carefully in September or October.

From Cape Howe to Portland is a far cry when it comes to prescribing an orchard for all the farmers who toil between these places, and no one is more conscious than the writer how many varied plans there must be before all may succeed in making a success of an acre or two of fruit trees.

Drain, Deepen, Enrich the Soil.

Finally, let every piece of ground put under fruit trees be either drained or ditched, work to as great depth as possible, thoroughly cleaned of bad weeds and roots, and dunged and limed as far as it is possible to use these material There can then be very little doubt but that trees of some kind or another will thrive well enough to make the venture a successful one.

The Highland Farm Orchard.

Homesteads lying from 1,000 to 1,500 feet elevation are limited to orchard trees which can endure severe frosts, and have the capacity for fruiting in comparatively short summers. Of such are apples, pears, plums, cherries, and all the small fruits.

The main points in planting in high cool country are—Choosing very airy and well-lighted positions, selecting small wooded types of trees, planting them a good distance apart—from 24 to 36 feet, according to their size and the richness of soil—and keeping the soil firm and comparatively dry in winter. Let us explain these points further. Confined positions make the trees grow coarse, and in some cases they accumulate a great deal of filth in the form of insects, mosses, and other parasites. Well-lighted positions prevent these. Large-framed trees fruit very late in life. and then but irregularly, whereas smaller types mature early and fruit regularly. Open planting secures plenty of air, heat, and light—all very essential in the hills and high ranges, Loose soil encourages roots, and thereby delays the fruiting of the trees: hence, when a tree is well grown it requires to be steadied by means of firm and well-exposed soil. Warm aspects are to be preferred, as also good natural drainage. The banks of streams, boggy or peaty earth, are unsuitable for orchards in high and cool regions, though it is always well to have command of water and plenty of solid material to keep up the fertility of the land.

Many of the points set out in the early part of this and the previous article need to be studied and acted upon before attempting the formation of a farm orchard in the cool hill districts of the State.

Shape and Size of Tree.

To induce a moderate size when fully grown, the hill orchard tree should have a long trunk, anything between 30 and 50 inches, according to the position and normal vigour of the variety selected. The branches will be light in direct proportion to the length and substance of the trunk. Light depending branches yield a small tree and more regular fruiting than is the case treewith a which has stout upright wood.

Pruning to Form

Very little pruning is necessary when starting orchards in hilly country, The main work is in the direction of thinning out branches in wrong positions, and in trimming up the trunk to secure a length proportionate to the vigour it displays. Thus one works to keep a weak tree with a short trunk and fairly upright branches, whilst a stout grower must be given a long trunk, not have any of the desired branches cut back, but left full length, that they may weigh out and give the requisite spread and degree of weakness to the head.

Agriculture and Stock.

Rotation of Crops.

No. II.

R. W. PEACOCK.

Climatic and local conditions determine in a great measure the crops which can be used to advantage. Other factors, such as price of seed, may render the general growth of some impracticable. The season of growth must be taken into consideration as well as the duration of a crop. In farm practice sufficient time to allow of the satisfactory preparation of the land, between the crops, must be allowed. In districts with limited rainfall several months are required.

Rotations which have been found most suitable for the conditions of the Bathurst district, together with the methods adopted and the reasons for such, as the following—

Rape, first year
Wheat, second year
Black tares, third year
Wheat, fourth year

The rape should be sown in February upon well prepared land. Upon light soils an application of phosphatic manure, containing a proportion of nitrogen, such as Shirley's No. 3, would be beneficial. The crop is fed off by sheep throughout the winter and spring. The residue of crop and excreta from stock are ploughed under in November. The land is left in this condition until the end of March or beginning of April, when it is again ploughed and sown early in April with wheat. During the summer the crop residue, etc., is decaying and becoming available for the ensuing wheat crop. The moisture of the soil is conserved by the ploughing in November, and any storms or showers are readily absorbed by the surface. Rape is a moderately deep rooter, and the thick roots, after decaying, form air channels in the soil, which are beneficial. The manure applied induces a more vigorous growth from which a greater quantity of stock food is obtained, also the increased crop residue and excreta ultimately form a greater amount of plant-food for the wheat crop. The vegetable matter thus given to the soil improves it mechanically, and the surface is not so liable to get out of condition by consolidating after heavy rains.

All weeds, including wild oats and stray wheat plants, peculiar to the wheat season, and which gain a foothold in the wheat crop to its detriment, are destroyed by the continuous stocking of the rape with sheep. The land is perfectly cleaned for the growth of a crop for seed purposes.

The wheat crop of the second year yields considerably more than if it were preceded by a similar crop. The land would be ploughed as soon as soon as possible after the wheat is harvested.

The black tares of the third year should be sown in February or early in March. They do not grow so quickly as rape and do not provide such quantities of winter fodder for sheep. In the spring they provide large quantities of good fodder. The plants should be kept from seeding, and the residue ploughed under about November. This crop is enabled, by the agency of bacteria, to fix in its tissues nitrogen obtained from the atmosphere of the soil. The ploughing in of the residue and excreta from sheep enriches the soil in nitrogen which is, during the processes of decomposition, rendered available for the ensuing wheat crop. By such methods fertility is maintained.

The above system of rotation may be modified to meet the exigencies of the farm. Many other crops may be substituted without materially altering the system. In the place of wheat, other cereals, such as barleys, oats, and tares, may be substituted. Other leguminous plants, such as Scarlet clover, which is an annual, and field peas, may take the place of Black tares. While mustard would, to a certain extent, take the place of rape. A mixture of both can be grown to advantage.

In a modified form of the above system, lucerne could be sown as leguminous crop. It makes excellent pasturage when sown upon wheat land. It should be used as the last crop of the course, and be down for three or four years, after which the land can come under cereal crops again with advantage.

To rotations with the summer] crops the same underlying principles apply. As cereals, maize, sorghum and millet may be sown. For leguminons crop, cowpeas may be sown with advantage; they are hardy, and make excellent sheep food. Potatoes and swedes] may be used as root crops. The cultivation necessary for the successful growth of summer crops when sown in drills improves the tilth, keeps down weeds, and liberates plant food, which is valuable for the ordinary cereal crops, such as wheat. Other crops, such as pumkins, melons, mangolds, onions, Jerusalem artichokes, kale and sheeps-burnet, may be fitted in at the discretion of the farmer.

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Essex Rape
Globe and Long Red Mangold
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Poultry Notes.

Fir rock lime, carbolized, is one of the best disinfectants one can use in a poultry house. The one objection is the harsh effect upon the feet and legs of the fowls; but if used with sawdust in and about the roosts I do not think you will be troubled with scurvy leg fowls.

The increase in poultry culture does not keep pace with the inhabitants. There is no nation that, aside from its natural increase, that receives as many emigrants as does America. This, and the increased consumption per capita is seen in the increasing price per dozen for eggs.

Fifty years ago we heard the cry that the country would be flooded with poultry and the prices would be less than cost to produce them, yet any year do we see an increase in the price both as a food supply and the fowls for breeding and exhibition purposes.

A light morning feed made up of meat, vegetation and grain mash. Then in the litter of a scratching bed throw cracked wheat and millet seed. They will scratch all day, when at 4 o'clock give mixed grains, what they will consume in a few minutes, having pure water for their last drink before going to roost. That is the rational and most productive way to feed.

In talking with an M.D. the other day I was surprised to learn of the decrease in the use of beef because of its evil effect upon people suffering from rheumatism, and the growing dislike and curtailed consumption of pork. These two items have their influence in the increase of consumption of eggs and poultry. It takes but a very small per cent. of consumption to affect prices and the poultrymen are reaping a benefit from these conditions.

An ill-smelling poultry house is a sure indication of a shiftless or neglectful keeper. There is no good excuse for it. A poultryhouse can be kept as clean or cleaner than a dairy barn, and with less work. If you don't intend to do it right better quit entirely. A filthy poultry house is the forerunner of many contagious and fatal diseases. Clean up.

Breeding fowls has its advantages even though one does not make the work financially profitable. It affords recreation, and inculcates in the breeder that higher and elevating appreciation of nature which always comes with the intelligent breeding of live stock of any kind.

Don't waste your time crossing pure bred fowls. There are Standard bred varieties of all sizes, shapes and colors, and you will find an ample field with any of them to try your skill in mating and breeding to develop special characteristics. Crossing Standard bred birds only make scrubs, and there are enough of them now.

Utility Birds.

Probably every member of the poultry fraternity sooner or later tries his hand at breeding fancy fowls. He may embark in the poultry business primarily for eggs or for broilers, but the fancy inevitably attracts him, and forthwith he sets about to produce fowls which will carry off the honors in the show room. Now, the desire to breed fine fowls which, in the show room, will elicit the admiration of our competitors and score well up in the nineties, is to be commended if not carried to excess, but in their eagerness to produce high scoring birds many breeders lose sight of utility, which, to my mind, should always be the main consideration.

During the past few years breeding for feather and form has brought the various breeds to a high standard of excellence, but the results would have been more satisfactory if general utility had received greater consideration. A permanent paying poultry business can be built up only by recognising the fact that the chief aim is to furnish eggs and meat for the table, and adhering to that idea in our work.

It is not true that fowls having extra laying qualities cannot also excel in the show room. The contrary has often been demonstrated by many breeders. Judicious mating is the means by which all of the desired qualities may be combined in a single bird, and results will be ample compensation for though it requires a greater length of time than to produce specimens excelling only in fancy points, they re-pay all care and time expended.

Eggs.

Keeping you busy?

Beware of the stolen nest.

Remove broodies every night.

Prices are low, but quantity makes up.

Preserve a few at least for home consumption.

Don't judge a hen by her present laying.

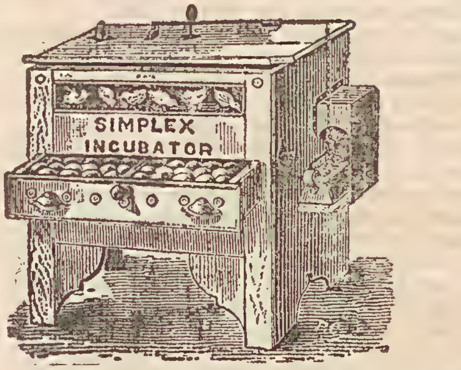
If the eggs aren't fertile now there's something wrong with the management.

Some time it is best to have the hens producing table eggs without males this time of the year.

Unfertile eggs keep much better than fertiles which are apt to germinate on the road to market in hot weather.

Keep the eggs in a cool place till ready for despatch. It will save disappointment to buyer and loss to yourself.

The winter egg usually takes up so much time in the mind of the average poultryman that he has but little time to think of the value of the summer egg, though it is worth more than a passing thought. He argues that if the winter egg brings 2s a dozen, it must be profitable; and if the summer egg brings only 6d, it must be produced at a loss. Yet we believe there is profit in the propositions. The mere fact of the difference in prices argues that the production must differ, and while we find a man in the winter getting a 20 per cent. production quite pleased; yet the same individual getting an 80 per cent. production at this time of year is downcast about the low prices. As a general thing, I believe that if a man goes in for egg-farming with the proper breeds and strains, and in the right spirit, the new laid egg will almost always pay a profit over the cost of its production. In summer, as a general rule, feeding comes a little cheaper in most cases, and a lot cheaper where there is a good range. I think, on the average, it will not cost more to feed the hens in summer when laying four days out of five, than it will in winter when they are only laying an average of an egg a week each. Of course, the increased eggs are more trouble to handle, and more trouble to quit; but a poultry man is kept going pretty well all the time, regardless of the season, and he can't do more than he is able. I guess if he is collecting enough eggs to keep him busy washing the best part of the day, he will be raking in a profit.



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Three Small Dairy Farms.

A.—This farm consists of 46 acres, near Yarragon, Gippsland. The whole of the land is now cleared. The last nine acres are just being brought under the plough for summer fodder crops for the dairy herd. These crops are to consist of maize (flat red), mangels, and sugar beet. The land was purchased about eight years ago, being then in its natural state; the price paid was something like £10 per acre.

To the inexperienced it would appear that the amount of labour entailed in reducing it from a wilderness to its present state of high productivity was sufficient to purchase the land without any capital whatever. This is not the case, however, and the owner is thoroughly satisfied with the result of his labour. Few men of his years can lay claim to having performed the pioneering work he has done, and be able to take things comparatively easy on the fruits of his own efforts. We believe this result is due, in the first place, to the indomitable pluck and energy of the man, assisted by the fact that only a small area of land was worked upon. Many men with five times the area of similar land failed during their own lifetime, and even their families after them have not arrived at the stage of advancement as is seen in the case in the farm under review. Much better would it have been had the original selectors been allowed in densely-timbered country like this to take up smaller holdings, say, 50 acres for each adult male in the family. The same efforts concentrated on a smaller area would produce quicker returns, and owing to the prolific nature of the soil the produce taken off the cleared portion would not supply the necessaries of life, but also help to pay for the portion of the clearing of the remainder, and thus relieve the selector of the necessity of the heavy toil of subduing and reclaiming the whole of the land himself. He could employ his time more profitably in the cultivation of the land already cleared, and in tending his stock. This feature stands out prominently in the case of the farm under review.

The farm is divided into thirteen paddocks, varying in size from two to eight acres, and when asked the reason for such close subdivision, we were informed that as a certain area, no matter how small, was cleared and might be producing revenue, whilst the remainder was being prepared. In this way prompt returns were secured, and in the owner's own words "the wolf was kept from the door." Due care was taken in the clearing of small areas that no unnecessary fencing was erected, and those erected could be allowed to stand permanently.

In addition to clearing, the land is all underground drained. Trenches about 2ft. 6in. deep are made every 2 chains, running north and south the full length of the farm. These are filled with split rails and covered with tussocks, and the soil spread over the top. Little evidence of this work can be seen on the surface, as the grass is growing as thickly as on any other part of the paddock. The result of this work, however is apparent in the healthy hue and the magnificent growth of the grass. It is intended to intersect these drains with others running east and west, so as to more thoroughly drain the land.

The principal pastures grown are alsyke, cow grass, and rye grass, a luxuriant growth of which is seen in all of the paddocks. Up to the present the whole of this farm has been devoted to dairying, with the exception of about 2 acres that were sown in potatoes and onions last year and a similiar area will be devoted to the same purpose this year. Maize and root crops (mangels and sugar beet) are the fodder crops grown, the former is fed in the summer and autumn green, and the surplus conserved in the form of ensilage. The method of making silage is cheap, and evidently gives good results, the maize being cut and carted into a stack, packed between upright posts and well weighted, little or no waste takes place, and the stock relish the food and yield well on it.

There are fourteen cows in milk now, and seven more to calve. The yield of milk at present is the lowest for some considerable time, chiefly on account of the continuous cold weather, and the fact that the severe winter kept the grass late in coming, and the supply of home-grown fodder in consequence ran short.

The actual averege yield of each cow taken from the number of cows in milk each month is 726 gallons, the value of which was £12 1s. 10d. per cow per year. The average number of cows in actual milk was fourteen, Among the herd were five heifers with their first calf, and three of the cows aborted, but were kept in milk. Some of the best of the cows are now very old, but still continue to yield profitably; the whole are of mixed breeding. A Shorthorn bull from a good dairy cow is used for breeding purposes. In addition to the twenty-one cows milking and to calve, there are ten head of other stock, including three horses and one bull.

Last year fifteen poddies were sold, realizing £1 8s. each, and two fat cows were disposed of at £5 each. A two-year-old draft filly, the progeny of one of the farm mares, is now valued at £30.

£30 is the actual amount estimated as profit from pigs.

The product from half-acre under onions was £30, and three-quarter acre potatoes £12. Yorkshire hero peas (5 bags) were grown and sold, realizing £8 15s net.

Onions and potatoes were used for household purposes, and two tons of potatoes are kept for seed, the value of which is not taken into account.

The total result from sales as enumerated above is £111 15s. added to milk cheques £281 0s 9d. from a 46 acre farm in one year. The enhanced value of the two-year-old draft filly could for the year safely be calculated at £10. The two tons of seed potatoes would give another £14, bringing the total up to £305 0s 7d. or the respectable average of £6 12s. 7d. per acre per annum.

The owner contemplates erecting an up-to-date milking shed as his next move, and after that a modern silo, and he himself says he intends making the farm do a little more in future, and enable him to do less himself.

It may be mentioned that the cows are given about three or four weeks' rest before calving, are rugged in winter, and fed on ensilage, chaff, and bran; when the former runs out, mangels and sugar beet are used.

B.—This is another farm in the same district, on the fringe of the Moe swamp. The land was purchased about five yrs ago, The original holding was 58 acres. This was cleared of timber and scrub and put under pasture and crop, Sixty-two acres have lately been added to the holding, only a small portion of which is yet available for depasturing and cropping. The total area consists of 120 acres, of which about 80 have been cleared and improved. The amount of stock carried at present is over 70 head.

The number of dairy cows is 30, but never more than 27 are in milk at any one time. The cows are of mixed breeds, showing a lot of Jersey and Ayrshire blood, the latter predominating, and are of small size, being what you would call "good little cows." The total value of milk sold and produced during the year 1905 is £312 15s. to which must be added £90, value of pigs and calves, or a total from this farm of £402 15s.

The pastures consist of alsyke, white clover, cow grass, and rye grass. Maize is grown for fodder, and conserved in the form of stack ensilage

At one time last season, the directors of the Trafalgar Butter Factory, wishing to verify the results obtained from the herd, and knowing how many cows were milked, the manager was instructed to attend, unknown to the owner, weigh the milk from each cow, and take a sample for testing, The result was a total of 912 lbs., or 91 gallons for the day from 20 cows, averaging 4½ gallons per cow. The remaining 10 cows were strippers, and gave 20½ gallons, The whole 30 averaged over 3 gallons per cow. The average test was 3.7 per cent of butter fat.

C.—While at Nagambie in connection with the farmers' classes being held there, we were told of a herd of pure shorthorns which gave very good results. On inspection, we found that they were the remains of a herd which had been kept pure for between 20 and 30 years. Pure shorthorn bulls have always been used. The herd in milk last year consisted of 11 cows, mostly heifers with their first calf, but these did not calve until they were 2½ to 3 years. They were consequently well grown, and bear out the contention that heifers should be this age before coming in, when they will give returns almost equal to mature cows. In the long run, they will be far more profitable than if brought in earlier, when their growth is checked, and, if persisted in, will gradually reduce the average size, and, consequently, the produbtion per head of the herd. Although these cows are pure short horn, many are typical dairy cows to all appearance. When there are steers for sale, they realize, when about 1½-2 years old, £1 to 30s. per head at auction more than those from other herds and this, taken in connection with the returns for butter, goes to show that the dual purpose cow is not altogether the myth many people suppose.

Eleven cows were milked last year, and gave a total return of £123 1s 8d for butter ex cream supplied to Messrs. Boddy and Partridge's Seymour factory, or average per cow of £11 3s 9d. In addition, butter and milk for the family were kept out, and the skim milk used for calves and pigs. We saw the morning's milk from typical dairy cow weighed. It turned the scale at 33 lbs at 4.3 per cent. equals over 1½ lbs of butter and this for the morning's milk must be considered good, as we saw that the cows were milked late the previous evening, and our visit was quite a surprise. The cows are mostly fed on a 40 acre paddock of lucerne. These cows had never been tested before, and so no system had been followed in culling, and not much interest taken in dairying now, although it had been extensively conducted and had been a scource of great profit.

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